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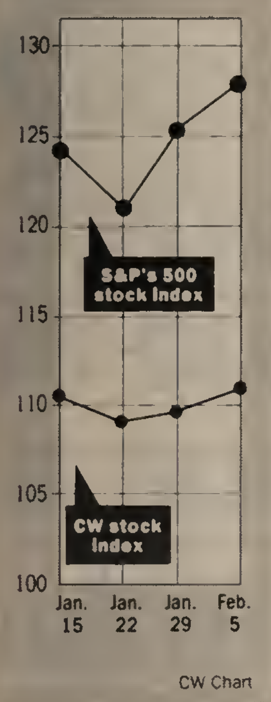

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The pitfalls of installing satellite networks bog down the market, but the future may be brighter. **Page 29.**

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Wang Laboratories will announce a downsized VS machine in the near future, but it won't use the single-chip processor approach of DEC's Microvax, a top executive told *Computerworld* last week. The company is also planning commercial release of its in-house computer-aided design and engineering technology, which runs on its VS systems.

■

Hayes Microcomputer Products, Inc. is the latest victim of the maturing personal computer market. The modem maker last week cut its 800-person work force by permanently dismissing 125 management and production employees. The company said it still remains profitable and is bringing expenses in line with sales.

■

NCR will unveil a "next-generation" high-end computer aimed at the on-line transaction processing market in the

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CDC project will succeed, Norris insists

Long-term programs key to future, founder says

By Clinton Wilder

CAMBRIDGE, Mass. — The "Damn the Torpedoes!" headline in Control Data Corp.'s recent advertising campaign typifies the attitude of William C. Norris, the feisty 74-year-old company founder who just last month retired from an active role in the troubled company. In an exclusive interview during a visit to Harvard University last week, Norris vigorously defended his often-controversial projects as the key to CDC's future prosperity.

"It wasn't the long-term programs like Plato computer-based education that caused the current problems," Norris said. "It was the current core businesses, particularly peripherals and the problems in international data services. The longer range programs offer the future of Control Data. At some point in time, say eight or 10 years, Plato will be the single largest source of revenue in Control Data."

In his 29-year tenure at the helm of perhaps the world's most eclectic and innovative mainframe vendor, Norris earned a range of labels: visionary, technocrat, manipulative manager, brilliant engineer, social do-gooder. The last moniker he resents bitterly. With CDC facing an estimated $400 million loss for 1985 and a serious short-term debt crisis, Norris says he believes more strongly than ever that his personal business philosophy will be vindicated. If not for CDC's troubled peripherals businesses, the company would have "rolled over" the competition, he says.

Norris agrees with the industry consen-

See **NORRIS** page 2

IBM pushes relational, updates DB2

By John Gallant

WHITE PLAINS, N.Y. — Repositioning its relational data base management system more as an alternative to the long-dominant IMS Fast Track DBMS, IBM last week boosted the performance of its DB2 product from 10% to more than 25%.

The sought-after performance upgrade [CW, Feb. 3] was hailed by users, who also applauded IBM's announcement of a much-needed monitoring system — dubbed DB2 Performance Monitor — that aids in the design and tuning of relational data bases. Analysts said Release 2's introduction was a strategic second step in DB2's evolution from a decision support tool to a founda-

See **IBM** page 4

Unix use still in development

By Eddy Goldberg

ANAHEIM, Calif. — The market for Unix-based products is beginning to mature but is still mainly the province of developers. That was the view of last week's Uniforum Show attendees, many of whom said a lack of off-the-shelf applications packages is slowing success in the business arena.

Also holding back widespread acceptance is the apparent confusion that exists concerning the many different versions of Unix that are being marketed and the failure of the industry to agree wholeheartedly on a standard. A major disappointment was AT&T's failure to announce a refined

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CW EXCLUSIVE

One-stop shopping: Ashton-Tate eyes mainframers' tactics

By Maura McEnaney

After three years as the leader in the young microcomputer data base market, Ashton-Tate is aiming to follow in the footsteps of older mainframe software companies with plans to offer a full line of services to back up its products.

Under the direction of 33-year-old Edward Esber, the industry's third largest independent micro software company — vendor of the popular Dbase product line — is pursuing avenues so far unique in its market. If successful, the moves will position Ashton-Tate in the same league with more established mainframe software firms that have built a steady stream of revenue from service offerings that complement products.

"We intend to be the biggest computer services company in the business," Esber said. "It's time for us to broaden our scope."

According to Roy Folk, executive vice-president for marketing and strategic planning, the company has been laying the groundwork for the transition. "We'll want to proactively be providing applications, consulting services and training services," he said. Ashton-Tate provides some training but only arranges for consulting services. "We don't have an aggressive, independent organization that provides consulting services," Folk said.

Edward Esber

The time seems to be right for such a move by the fast-growing 5-year-old company. Every year since 1983, Ashton-Tate's net revenue doubled, reaching $82 million in fiscal year 1985. Sales for the fiscal year ended in January are expected to hit $115 million and will be augmented by an anticipated $30 million in revenue from Multimate International Corp., the East Hartford, Conn.-based word processing vendor that Ashton-Tate acquired last year. The company has even taken on a more established look, moving from its warehouse headquarters in Cul-

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NEWSPAPER

IBM joins ranks with competitors in Corporation for Open Systems

Endorses vendor move to facilitate connectivity

By Bryan Wilkins

ARMONK, N.Y. — Endorsing the campaign to develop standardized communications between proprietary data network architectures, IBM announced last week it will join with rival computer companies in the recently formed Corporation for Open Systems (COS) consortium.

IBM's decision to join ranks with its principle competitors that were founding members of COS marks the company's acceptance of the need to open its proprietary Systems Network Architecture (SNA) to other vendor products because users are demanding connectivity.

COS is a nonprofit corporation, initially established by 17 computer and communications companies to accelerate the introduction of products based on international standards, principally the seven-layer Open Systems Interconnect (OSI) model set forth by the Consultative Committee on International Telephony and Telegraphy (CCITT), the world standard-setting body.

Seeking CCITT approval

Two weeks ago, IBM said it was seeking CCITT approval of its Advanced Program-to-Program Communication, or LU6.2, product as an accepted implementation of the OSI communications standard.

John King, a Carmel, Calif.-based consultant and an expert on networking IBM products, said last week that since SNA is "the overwhelming architecture of choice among users," LU6.2 will most likely become a de facto standard for linking micro-based programs to departmental mainframes.

King said IBM's competition in the past tried to use OSI as a weapon against SNA, an effort he predicted would now fail since IBM is joining their ranks to develop standards to connect to its product line.

Standardized connection to IBM

King predicted that 99% of computer vendors will have to adopt some standardized connection to IBM. He also predicted that interconnectivity among mainframes "will explode" in the next few years. "It's clear we can't go on with the software approaches to connectivity that we are using now," King said.

COS is supporting the CCITT and the U.S.-based National Bureau of Standards' efforts to expedite adoption of certified OSI implementations.

Among the founding members of COS are: AT&T, Amdahl Corp., Burroughs Corp., Control Data Corp., Digital Equipment Corp., Hewlett-Packard Co., Honeywell, Inc., NCR Corp., Northern Telecom, Inc., Sperry Corp., Tandem Computers, Inc., Wang Laboratories, Inc. and Xerox Corp. Intel Corp. has subsequently decided to join, also.

Norris insists CDC project will succeed

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sus that CDC's major downfall was its peripherals and storage business, the former company cash cow that is expected to account for at least $100 million of its 1985 losses. He said that CDC rested on its handsome profits, failing to anticipate the market and technical changes that allowed Japanese and other competitors to devastate prices, particularly in low-end storage products, the area in which CDC had a major stake.

Control Data Corp.'s Norris

"I think that some of it was complacency, the same disease that hit the automobile industry," according to Norris. "The business was profitable, and executives just couldn't imagine it ever ending. There were discussions three or four years ago about speeding up new developments and improving productivity, and the reaction was, 'Aren't you ever satisfied?' I'm not offering that as an excuse, but with that attitude, it was hard to move as rapidly as we should have. I take responsibility for that. If we had not had the problems in peripherals, we would have rolled over the rest of them."

Nurturing CDC's installed base

Norris says he believes the hopes of CDC rest not in penetrating the Big Blue armor of commercial MIS departments but in safeguarding and nurturing its traditional installed base of scientific, engineering, academic and computer-aided design and manufacturing users.

"The scientific/engineering market keeps growing; everyone and his dog is getting into it now, and that gives you some indication. Education is ultimately going to be the biggest market there is for computers. There, we're the leaders; all we have to do is keep moving, and we'll maintain leadership."

Norris declined to predict when CDC will staunch the flow of its current losses and return to profitability, but he said that "90% of the turnaround has already happened."

He expressed full confidence in the ability of his hand-picked successor, Robert M. Price, to weather the current fiscal storm, rejecting industry speculation that Price's job security as chairman depends on the speed of that turnaround. Still, Norris admitted that he delayed his retirement until he was confident that the CDC ship would remain afloat.

"I had been wanting to make a change for over a year, but then these problems came along, and I really wasn't comfortable in leaving until I felt we had a direction that would lead to solutions," Norris said. "The idea that Bob Price's position is temporary has no substance at all. He has no time frame; his promotion is part of the plan put in place five years ago."

Norris takes umbrage at the charge that CDC's social outreach businesses diverted company and management attention away from its core business, and he insists that all of its ventures were intended to make money over the long term.

"We've never had so-called social programs; what we've had are programs that address unmet social needs as profitable business opportunities," he said. "It's the press that is always twisting it around and making it look like I'm frittering away stockholders' money."

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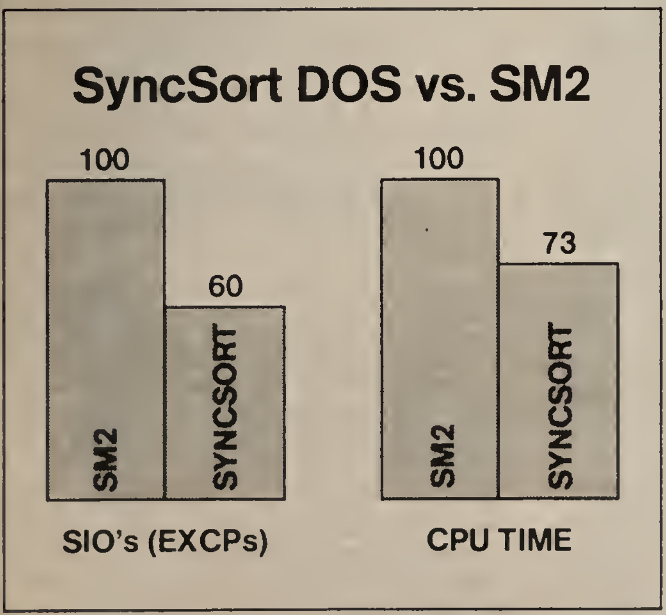

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IBM pushes relational

From page 1

tion for the bulk of operational systems. The announcement, they said, also casts doubt on the future of IBM's IMS Full Function, one of the most widely installed DBMS products.

IBM said Release 2 marked a repositioning of DB2 to meet a broader range of DBMS needs. R. H. Williams, a vice-president of IBM's General Products Division, said in the announcement: "Any customer who needs a DBMS should seriously consider DB2 for both decision support and operating data bases." Norris Vandenberg, DB2 project office manager with the Santa Theresa Laboratory software development facility in San Jose, Calif., told *Computerworld* that customers will look first at DB2 for their needs, rather than IMS. (See story page 5.)

Users were excited about the release, said Richard Finkelstein, secretary/treasurer of the Midwest DB2 Users Group. "By getting the transactions-per-second level up, users will be able to rely on DB2 for more real production systems. Some users are saying that DB2 now looks as good as any transaction-oriented DBMS available.

"It may not be all the performance people were hoping for, but it's a start," Finkelstein said. "By the time users get major systems into production, the performance should be sufficient."

Finkelstein's comments were echoed by Myles Walsh, director of data library development with the CBS Records Division of New York City-based CBS, a user of DB2. "IBM never boasted about DB2's performance. IBM realized performance needed attention and addressed it."

Performance benefits vary

Figures released by IBM indicate that Release 2's performance benefits vary according to the size of the processor. Running under MVS/XA, it offers a 10% to 14% performance boost over Release 1 on an IBM 4381 Model 2 and a greater than 25% increase on an IBM 3090 Model 200. That, IBM said, means the maximum transaction processing rate is 5 transaction/sec. on the 4381 and 45 transaction/sec. on the high-end processor.

"The percentage numbers can be a bad way to look at the improvements," said Robert Ashton, a consultant with Boston-based DB View, Inc., a DB2 performance consulting and training company. "The key enhancement is the improvement of the access-path selection mechanism to provide more efficient access to data through increased use of indexes," he said.

"People shouldn't be viewing the performance of relational systems as a problem," Ashton continued. "This is an indication that a few years down the road people may find that DB2 actually performs better than IMS. IBM really intends to go after companies like Cullinet Software, Inc. and Applied Data Research, Inc."

DB2's performance boosts result from, among other enhancements, modifications to the physical structure of the DB2 catalog and the added ability to buffer, or store, data base records in anticipation of their use, thereby reducing physical I/O activity. Other enhancements include a so-called application plan segmentation facility that allows the system to bring only the portion of a program plan — the code that supports SQL statements — that is actually to be executed into the DB2 buffer; and improvements to the path selection mechanism.

> ***"IBM realized DB2's performance needed attention and addressed it."***
>
> **— Myles Walsh**
> **CBS Records Division**

Release 2 also provides an Explain function that lets users see how DB2 retrieves data requested by SQL statements. The function allows data base administrators to review and modify DB2 performance. The system's relational capabilities were also improved, though not as significantly as some users had hoped and analysts had predicted. The upgrade did not affect the size of the relational tables DB2 can support.

"It seems clear that IBM's intent is to move DB2 into the IMS performance range," said Frank Gens, an analyst with International Data Corp., a Framingham, Mass.-based market research firm. "It seems to mean that during the next few years IBM will be attempting to push IMS Full Function aside."

Gens noted that Release 2 did little to address DB2's other perceived weakness, a lack of applications development tools. "Even with this boost, DB2 still falls on the low end of the performance range compared to the offerings of the independent software vendors."

According to Finkelstein, the absence of the integrated development environment is the single biggest obstacle to DB2's broad success. "Even though it offers tremendous productivity gains for querying and reporting, a production system just takes too long to build."

Thus, Gens added, DB2's fate in the next few years could well rest in the hands of independent software vendors that supply compatible development tools.

In the aftermath of Release 2, competitors in the burgeoning relational DBMS market reacted to the new DB2. Software company heads said IBM's strategic emphasis on DB2 has made relational systems more acceptable for production uses, but they claimed DB2 still has a lot of catching up to do.

"The announcement makes DB2 more competitive, but IBM still essentially has the dual-DBMS strategy in place," said Martin Goetz, president of Applied Data Research, which markets the Datacom/DB system. "DB2 has a long way to go to match Datacom/DB. And we are moving ahead aggressively."

In an interview this week, Software AG Chairman John Maguire said, "Even granting DB2 five years, the product is where Adabas was 10 years ago." (See story page 33.)

No price increase

Release 2 of DB2 came without an associated price increase. IBM claimed that it is standard practice for the company to price according to version, not release, number. But Gens noted that the relational marketplace is highly competitive and price sensitive, and he suggested that IBM did not want to tarnish the public relations aspect of the release with a price hike.

Release 2 is scheduled to be available in early March, with an initial license charge of $16,050 and a monthly charge of $2,675.

■

"Because the IBM DB2 environment is so dynamic, having a good performance monitor is really important. Users were looking for one; they needed a better understanding of how resources were being consumed."

Ashton's words summed up the feelings of many users and analysts about IBM's introduction last week of the DB2 Performance Monitor.

The DB2 Performance Monitor is an off-line tool that allows users to create reports and graphic presentations that illustrate system performance, aid in tuning DB2, identify bottlenecks and exception conditions and can be used to predict the effect of an application on the system and other programs. The system works in conjunction with IBM's Graphical Data Display Manager.

"The lack of a performance monitor was a big issue with users," Midwest DB2 Users Group's Finkelstein said. "But it has been addressed nicely. As long as IBM continues on this course, things look good."

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IBM to support IMS Full Function for the ‘indefinite future’

But exec says DB2 will be emphasized

INTERVIEW

By John Gallant

The announcement of Release 2 of IBM’s DB2 prompted many analysts and users to question the role that IMS Full Function — one of the most widely used data base management systems — will play in IBM’s evolving DBMS strategy.

Norris Vandenberg, DB2 project office manager at IBM’s Santa Theresa Laboratory, a San Jose, Calif.-based software development facility, explained the company’s view of DB2’s enhanced capabilities and its impact on IMS.

IBM said Release 2 represents a repositioning of DB2 beyond query and reporting applications. That repositioning seems to put it squarely into competition with IMS Full Function. Is DB2 now an effective replacement for Full Function?

No, it is not a replacement. This level of performance is going to cause DB2 to be the data base system people look at first. But there is a very large set of applications for which IMS will always be suitable. These are applications that require extremely high transaction rates and high availability. IMS is uniquely positioned to satisfy those requirements.

How is IBM going to respond to IMS users who feel the company is moving away from IMS Full Function?

We are not moving away from IMS. We are still — here at Santa Theresa — making a very significant investment in enhancing IMS. That work will continue for the indefinite future.

Is IBM continuing to market IMS actively?

IMS is being marketed, but what we will see in 1986 is a lot of emphasis on DB2.

That is because we are very comfortable that Release 2 of DB2 is a very good vehicle for applications development.

How does DB2 Release 2’s performance compare with IMS Full Function for batch processing?

I don’t have specific numbers to quote on that. Obviously, IMS remains our high-performance data base system.

Even though we are showing significant improvements here with DB2, there are going to be some environments where IMS is the most suitable vehicle to use because of its high throughput rates.

Some people have said that DB2 consumes about 1½ times the amount of processor resources compared with IMS. Is that accurate?

In previous measurement studies with Release 1 of DB2, we observed that it consumed from 1.65 to 2.3 times as many resources as did IMS, depending on whether there was an IBM TSO or IMS front end being used. We expect that number to improve greatly.

What was widely quoted was that DB2 was 2:1 in terms of resource consumption. In fact, that number will be significantly better. I am not prepared to quote a specific number today.

Is IBM striving to regain some lost share in the DBMS market?

We are very interested in making DB2 a highly successful product. We think there is no reason that every MVS customer shouldn’t have DB2. It will help customers be more productive and get applications up on-line faster.

Release 2 did not really address the productivity tool criticism that is often leveled against DB2. What is IBM’s long-term strategy for providing an integrated applications development environment?

Everyone agrees that, in order for people to have the right level of productivity, getting the right set of tools in their hands is extremely important.

With Release 2, we did announce ongoing support for a large set of products including the IBM Cross Systems Product (CSP)-DB2 Interface, which provides integration between an application generator and the DBMS. That trend is going to continue very strongly.

Are you going to go forward with CSP as a base for improvements?

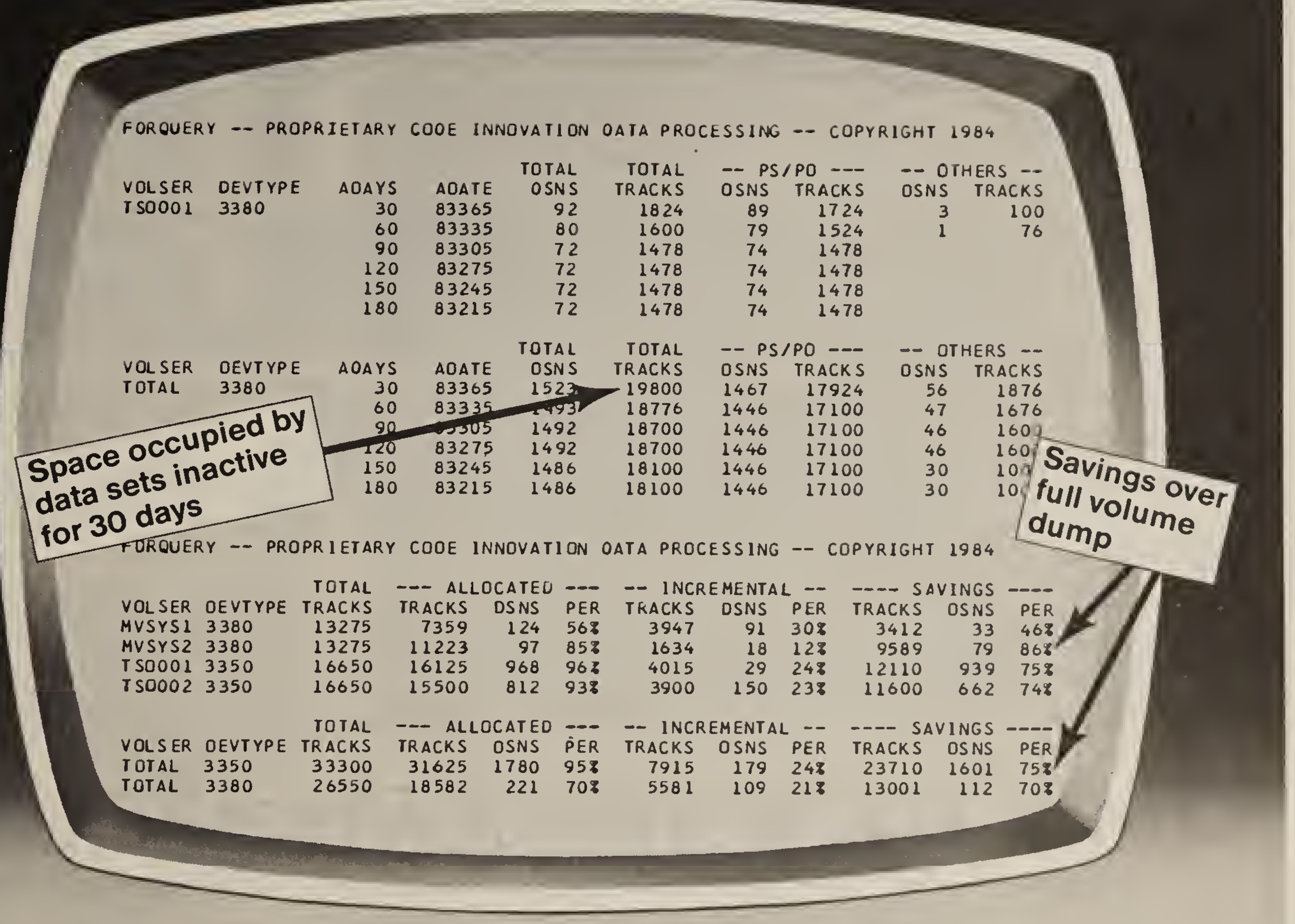
It was not my intent to say that. There has been a lot of emphasis placed by us on CSP right now because we view it as a very, very good applications generator for this kind of environment.

Is IBM encouraging and helping independent software vendors provide productivity tools for DB2?

Very much so. We have held several workshops for vendors, and we will be holding another one very soon.

We try to provide as much technical information as we can so that independent software vendors know how to put applications on top of DB2.

WHAT DOES THIS REPORT MEAN TO YOU?



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                                    TOTAL     TOTAL     -- PS/PO ---     -- OTHERS --
VOLSER   DEVTYPE     AOAYS   AOATE   OSNS    TRACKS     OSNS  TRACKS     OSNS  TRACKS
TSO001   3380           30   83365     92      1824       89    1724        3     100
                        60   83335     80      1600       79    1524        1      76
                        90   83305     72      1478       74    1478
                       120   83275     72      1478       74    1478
                       150   83245     72      1478       74    1478
                       180   83215     72      1478       74    1478

                                    TOTAL     TOTAL     -- PS/PO ---     -- OTHERS --
VOLSER   OEVTYPE     AOAYS   AOATE   OSNS    TRACKS     OSNS  TRACKS     OSNS  TRACKS
TOTAL    3380           30   83365   1523     19800     1467   17924       56    1876
                        60   83335   1493     18776     1446   17100       47    1676
                        90   83305   1492     18700     1446   17100       46    160
                       120   83275   1492     18700     1446   17100       46    160
                       150   83245   1486     18100     1446   17100       30    10
                       180   83215   1486     18100     1446   17100       30    10
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                    TOTAL   --- ALLOCATED ---   -- INCREMENTAL --   ---- SAVINGS ----
VOLSER OEVTYPE     TRACKS   TRACKS  DSNS  PER   TRACKS  DSNS  PER   TRACKS  OSNS  PER
MVSYS1 3380         13275     7359   124  56%     3947    91  30%     3412    33  46%
MVSYS2 3380         13275    11223    97  85%     1634    18  12%     9589    79  86%
TSO001 3350         16650    16125   968  96%     4015    29  24%    12110   939  75%
TSO002 3350         16650    15500   812  93%     3900   150  23%    11600   662  74%

                    TOTAL   --- ALLOCATED ---   -- INCREMENTAL --   ---- SAVINGS ----
VOLSER OEVTYPE     TRACKS   TRACKS  OSNS  PER   TRACKS  OSNS  PER   TRACKS  OSNS  PER
TOTAL  3350         33300    31625  1780  95%     7915   179  24%    23710  1601  75%
TOTAL  3380         26550    18582   221  70%     5581   109  21%    13001   112  70%
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IBM broadens Personal Computer support for Profs

By Eric Bender

WHITE PLAINS, N.Y. — Software designed to give IBM Personal Computer users access to a broader range of Professional Office System (Profs) functions was announced last week by IBM's Information Systems Group.

IBM will offer the new Profs PC Support software under an unusual installation/pricing scheme that apparently is making its debut in an IBM mainframe environment.

IBM also introduced upgraded versions of ISPF for the Personal Computer (ISPF/PC, commonly known as EZ-VU) software.

Profs PC Support, which IBM described as an enhanced alternative to the Profs PC Connection program released in mid-1984, works in conjunction with Profs Release 2 on an IBM host. The Personal Computer software handles in-basket processing of notes and documents, viewing and processing of mail and local printing.

Profs PC Support functions

Among enhancements over the earlier product, Profs PC Support provides incoming mail processing for documents, transfers some document management functions from the host to the Personal Computer and offers menu-driven procedures to store and mail Personal Computer documents on the host.

Additionally, users now can write programs, employing Personal Computer user exits, that permit them to execute PC-DOS commands from any screen except the Help screen to customize the printing and viewing of documents and to customize file transfer requests, according to IBM.

PC Support users can also store groups of files on the host Profs data base. The files may be IBM Displaywrite documents, spreadsheets or other reports, the company said.

"It's a fairly significant announcement in that it emphasizes the cooperative processing scenario that IBM has been slowly implementing," commented Charles Roussel, analyst with the Yankee Group. However, he added that "none of these features are that spectacular" compared with the earlier PC Connection product.

Profs PC Support's installation and pricing setup seems to represent a new approach for IBM mainframe computer environments, although a spokeswoman was unable to confirm or deny this.

"The software is installed on the host system, and the PC code is downloaded to a PC, from which master diskettes are made," the spokeswoman said. Users are then required to mark all copies, including the master diskette, with an external IBM copyright notification.

The pricing scheme establishes costs by number of micro users. The one-time cost for up to 100 micro users is $6,000; supporting 101 to 500 users costs an additional $3,000, while for 501 to 1,000 users the price climbs another $3,000. Monthly charges are $300, $150 and $150, respectively.

New for IBM

Apparently this setup is new for IBM, Roussel noted. "They're being realistic — in terms of offering pricing for that many users." Yankee Group estimates show about 1,200 Profs licenses sold, compared with about 850 for IBM's other mainstream office system environment, Distributed Office Support System, Roussel said.

Available Feb. 7, the Profs PC Support micro software runs on the Personal Computer, Personal Computer XT, AT, Portable PC and the members of the 3270 Personal Computer family. In addition to communications hookups, it requires PC-DOS 2 or above, the EZ-VU II Runtime Facility and 192K bytes of storage (not including space for PC-DOS, EZ-VU or communications programs).

EZ-VU II is aimed at speeding development of interactive Personal Computer applications. Enhancements over the earlier version include the ability to design full screen display panels and to specify I/O fields. The EZ-VU II Development Facility costs $495, and the EZ-VU II Runtime Facility costs $59. Both are scheduled for Feb. 14 availability.

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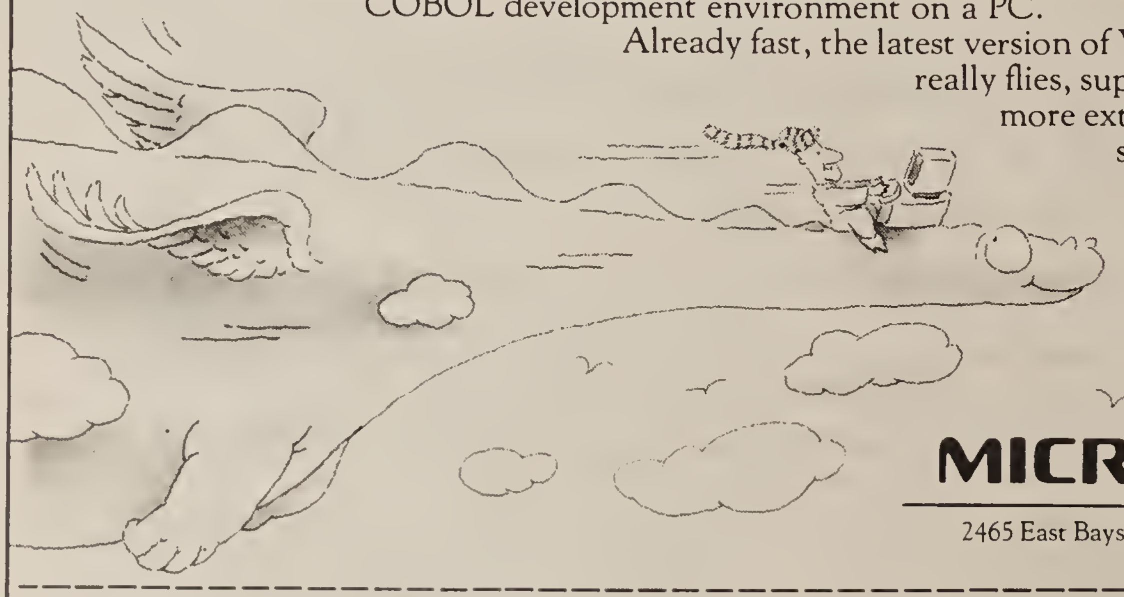

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CW 2/10

IBM enhances SQL/DS, DXT

In conjunction with the introduction of DB2 Release 2, IBM last week announced Release 3.5 of SQL/DS and Version 2, Release 1 of the Data Extract (DXT) system.

■ SQL/DS Release 3.5, IBM's relational data base management system for VM and DOS/VSE environments, boasts improved data base backup and archive capabilities as well as enhanced recovery and error diagnosis facilities. It is available now for a monthly charge of $464.

■ With the release of DXT, users can now draw information from DB2 and SQL/DS relational data bases as well as from the previously supported sources, including VSAM, sequential files and DL/1. The data can then be loaded into DB2 and SQL/DS. Data may be transferred among subsystems on the same processor and subsystems on different processors or stored elsewhere. It will be available in September for a basic license charge between $300 and $1,550.

— **John Gallant**

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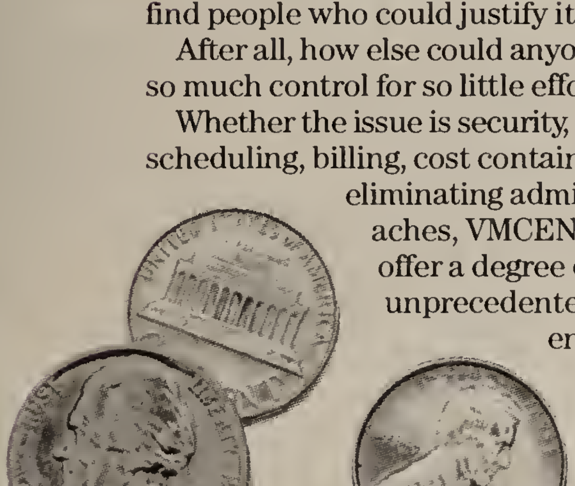

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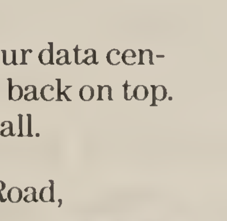

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RUN WITH THE LEADER

TOP OF THE NEWS

NEWS from page 1

first half of 1986. NCR CEO Charles Exley told *Computerworld* the fault-tolerant offering is "quite a radical product."

■

U.S. Rep. Timothy E. Wirth (D-Colo.) last week urged the Department of Labor to approve an Aug. 15 petition for trade adjustment benefits to about 5,000 workers who lost their jobs at Storage Technology Corp. in Louisville, Colo. "While we can be encouraged by news that the company anticipates either breaking even or turning a small profit," Wirth said, "there are thousands of workers who need help finding new futures."

■

Meanwhile, Storage Technology last week reported a $43.7 million operating loss for 1985, on revenue of $673.4 million. In 1984, the company posted a deficit of $505 million on revenue of $808.5 million. The company said that it will probably have to issue new stock to emerge from bankruptcy.

■

IBM said last week it will issue the $300 million debt offering that it was considering last month. Investors purchasing the 10-year Eurobonds can exchange them for Intel Corp. common stock at $38.50 per share. Intel's stock was trading Friday at $30.25 per share.

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WORLD DIGEST

Computerworld News Service

MILAN, Italy — Ing. C. Olivetti & Co., the Italian office automation firm, and Microage Computer Stores, Inc. of Phoenix have announced plans to create a personal computer retailing chain in Europe.

The new company, Microage Europe, will reportedly establish independent franchises in Britain, France, West Germany and Italy.

MADRID — Spanish telephone company Compania Telefonica Nacional De Espana and U.S. multinational Pacific Telesis Group have announced an agreement to design and construct jointly a research and development center near Madrid.

The center will reportedly employ about 600 people and will design integrated circuits for telecommunications use.

SEOUL, South Korea — Hyundai Electronics, a latecomer among South Korean electronics vendors in the research and development race for next-generation semiconductors, may soon leapfrog its competitors by delivering in July samples of 1M-bit dynamic random-access memory chips.

The majority of those chips will reportedly be shipped to the U.S.

MELBOURNE, Australia — Sperry Corp. is forming a joint venture with the Australian airline TAA to develop and export artificial intelligence software for the airline industry. The joint venture, known as Sperry Transport Systems, reportedly has received an infusion of approximately $150,000 from Sperry and the state of Victoria, Australia.

TOKYO — ATT International Japan and Alcatel, the top French private communications equipment supplier, have won approval to join an exclusive, 209-member Japanese vendor group, the Association of Communications Equipment Manufacturers (ACEM). The group has been criticized for excluding non-Japanese firms.

The two firms' entry increases the number of ACEM's foreign members to eight. Current foreign members include the Japanese subsidiaries of such U.S. firms as IBM, Motorola, Inc. and Rockwell International Corp. as well as the subsidiaries of such other non-Japanese foreign firms as Northern Telecom of Canada Ltd. and Phillips N.V. of the Netherlands.

LONDON — IBM said it plans to close its seven product centers in Great Britain to help its dealer network and to cut costs. The centers reportedly have been unprofitable. IBM will reportedly close centers in Edinburgh and Glasgow and in the English cities of Croydon, Manchester and Birmingham and two centers in London.

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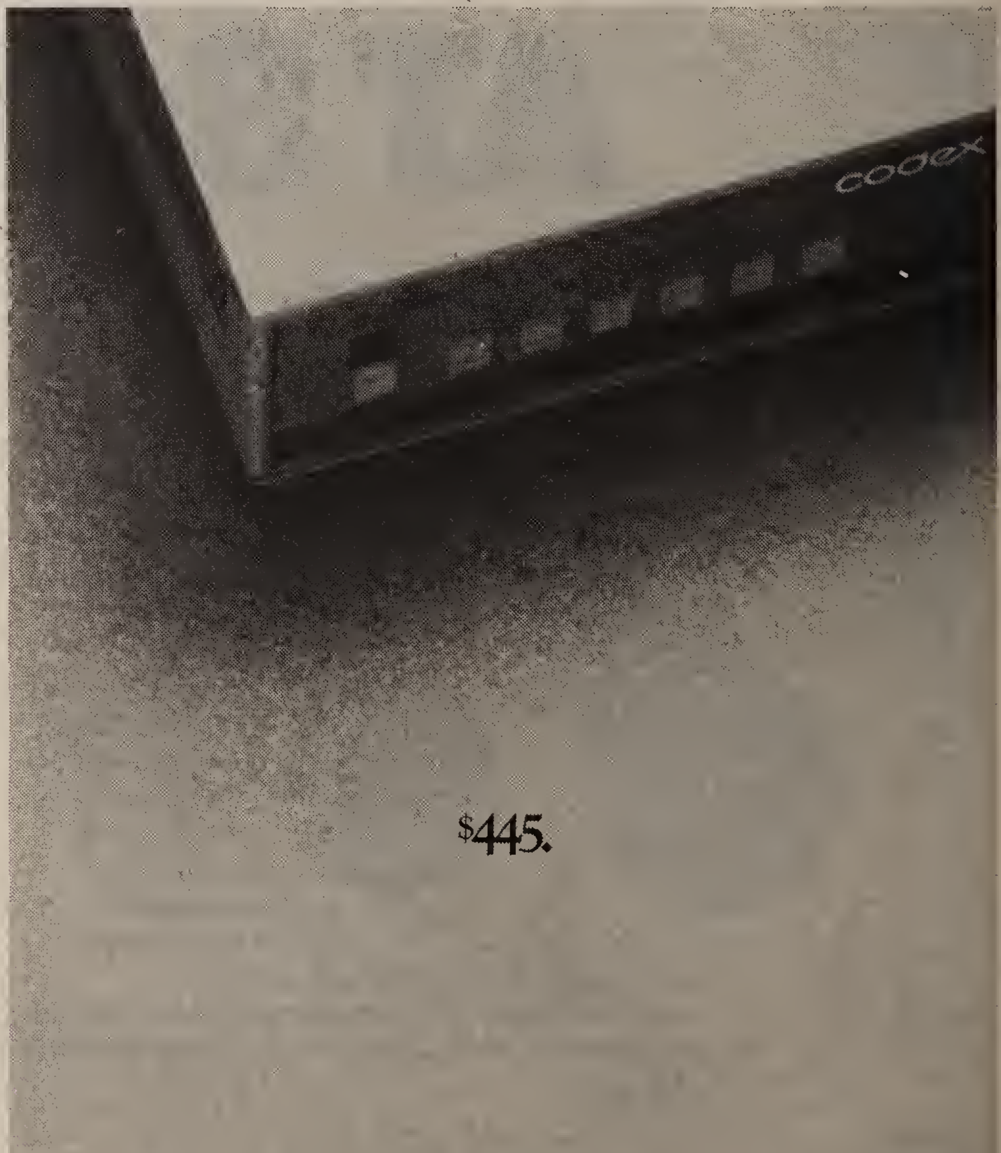

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- 85. Computer Service Bureau/ Software/Planning/Consulting
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- 75. User: Other ______
- 95. Vendor: Other ______

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- 22. Director/Manager of Operations/ Planning/Admin. Serv
- 23. Systems Manager/Systems Analyst
- 31. Manager/Supervisor Programming
- 32. Programmer/Methods Analyst
- 35. OA/WP Director/Manager/Supervisor
- 38. Data Comm. Network/Systems Mgmt.
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Anchorage	6-26-86	●	●			
ARIZONA						
Phoenix	2-18-86	●	●			
Phoenix	6-11-86	●	●	●	●	●
CALIFORNIA						
Los Angeles	2-4-86	●	●	●	●	●
Los Angeles	5-13-86	●	●	●	●	●
Los Angeles	6-10-86		●			
Orange County	2-5-86			●		
Orange County	3-10-86	●	●	●	●	●
Sacramento	3-4-86	●	●			
San Diego	2-25-86	●	●			
San Francisco	4-8-86	●	●	●	●	●
San Jose	5-14-86	●	●	●	●	●
Ventura	3-11-86			●		
COLORADO						
Denver	2-6-86	●	●			
Denver	5-8-86	●	●	●	●	●
CONNECTICUT						
Hartford	3-27-86				✱	
Hartford	5-21-86	●	●	●	●	
Trumbull	3-11-86	●	●			
DISTRICT OF COLUMBIA						
Washington	3-4-86	●	●	●	●	●
Washington	5-27-86	●	●	●	●	●
FLORIDA						
Jacksonville	6-10-86	●	●	●	●	●
Miami	3-19-86	●	●	●	●	●
Orlando	4-2-86	●	●			
Tampa	2-4-86	●	●	●	●	●
West Palm Beach	3-6-86	●	●	●	●	●
GEORGIA						
Atlanta	5-20-86	●	●	●	●	●
Columbus	6-18-86	●	●			
HAWAII						
Honolulu	6-17-86	●	●			
ILLINOIS						
Chicago	3-11-86	●	●	●	●	●
Chicago	5-6-86	●	●	●	●	●
Chicago	6-25-86	●	●			
INDIANA						
Fort Wayne	2-19-86	●	●	●	●	●
Indianapolis	3-11-86	●	●	●	●	●
Indianapolis	6-10-86	●	●	●	●	●
IOWA						
Des Moines	3-18-86	●	●	●	●	●
KENTUCKY						
Louisville	2-25-86	●	●	●	●	●
LOUISIANA						
New Orleans	6-19-86	●	●	●	●	●
MAINE						
Portland	5-20-86	●	●	●		
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Lowell	3-19-86	●	●	●		
MICHIGAN						
Detroit	2-18-86	●	●	●	●	●
Detroit	5-15-86	●	●	●	●	●
Grand Rapids	5-13-86	●	●	●	●	●
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Rye	7-10-86	●	●			
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Unix use still in development

From page 1

Unix System V at the show.

Despite the growing awareness by Unix vendors of the pressing need to provide applications for everyday business tasks, it remains to be seen whether they can deliver the products. Still, Unix gained a new commercial legitimacy with the presence of IBM at Uniforum. Exhibiting at the show for the first time, IBM staffed a large booth with about 20 representatives demonstrating a variety of equipment, including the recently released RT Personal Computer workstation.

Despite a lack of new product introductions, attendees were impressed that major vendors like IBM were present. "There is not that much new in applications and machines compared with last year, but more important is that vendors are filling out their product lines and making a stronger commitment to the Unix marketplace," said Ray Swartz, president of Berkeley Decision/Systems, Inc., a firm involved in teaching Unix programming.

A recent market forecast by IDC West, a division of the Framingham, Mass.-based International Data Corp. market research firm, predicted Unix-based systems will represent 10.9% of the overall systems market this year and will increase to a 14.6% market share in 1990.

Swartz said he believes the Unix industry is consolidating and moving toward widespread acceptance. "Users are starting to realize that Unix will survive; it is bigger than the companies that are in it," he said. "But if Unix is going to make it, it will be as an approach to solving problems."

One eager attendee was a computer-aided design and manufacturing (CAD/CAM) systems manager at a major West Coast shipyard. Although his operation had long been oriented on Digital Equipment Corp.'s VMS system, he is looking to Unix as the solution for integrated, automated manufacturing needs at the shipyard. The manager, who asked not to be named, installed Sun Microsystems, Inc. workstations for applications such as manpower management, automated planning and estimation of ship overhaul projects as well as for compiling job bids.

Uniforum coverage continues on page 12

"Unix is opening up a whole new world to us," the manager said. "It's very powerful and has a lot of applications." He added that Unix supports the U.S. Department of Defense's Transmission Control Protocol/Internet Protocol, which fits in with his plans to network the entire shipyard.

More than 200 exhibitors showed their wares at Uniforum, and attendance reached nearly 12,000 on the first day, according to Liz Reilly, 1986 program chair. She said attendance this year was on target with her expectations and was about the same as last year.

Many attendees came looking for off-the-shelf solutions, but sales of Unix-based applications packages are still being made largely through third-party resellers.

Mark Krieger, president of Unipress Software, Inc., which distributes Unix-based application packages written by independent authors, noted that many value-added resellers and systems integrators stopped by his booth. Most of his sales continue to be to developers, not end users. "People buying Unix machines and packages tend to be technical types who are buying it for development," he said.

One such value-added reseller, Lee De Koekkoek of Accounting & Bookkeeping Systems, in Lakewood, Calif., was looking for packages to modify and customize. He said he did not find much at the show.

But Douglas Smith, vice-president of systems development at Functional Solutions, a Utica, N.Y.-based systems house, came in search of data base software and tools to help him develop specialized applications.

"Hardware vendors are not in a position to develop applications," he claimed. "They need to develop tools for third-party developers so they can work with end users."

One attendee, Timothy P. Hathaway, an engineering manager at Megatek Corp., a San Diego-based manufacturer of CAD/CAM products, was exploring Unix as an alternative to the VMS environment. He said programmers are anxious to work with Unix, but he also is looking for productivity gains that Unix may provide his shop.

"I'm looking for any tools that can help with our firmware development," Hathaway said. "But I still have many questions about converting to Unix."

'Unix connections'

The official theme of the show, "Unix connections," emphasized how different applications written in Unix can run on varied hardware from different manufacturers. An intervendor Ethernet local-area network connected machines from nearly 30 proprietary system manufacturers.

But that connectivity will be limited until the industry agrees on one standard Unix version, attendees said. Many had hoped AT&T would announce System V Release 3 at Uniforum, but they were disappointed. The current consensus is that such an announcement is at least two months down the road.

Meanwhile, AT&T is working toward a standard Unix through the System V Interface Definition, issued by AT&T in February 1985 and developed by Unisoft Systems Corp., a provider of Unix-based software and services from Berkeley, Calif. Bob Ackerman, president of Unisoft, said that the need for standards is being driven by demands from both federal government agencies and commercial users.

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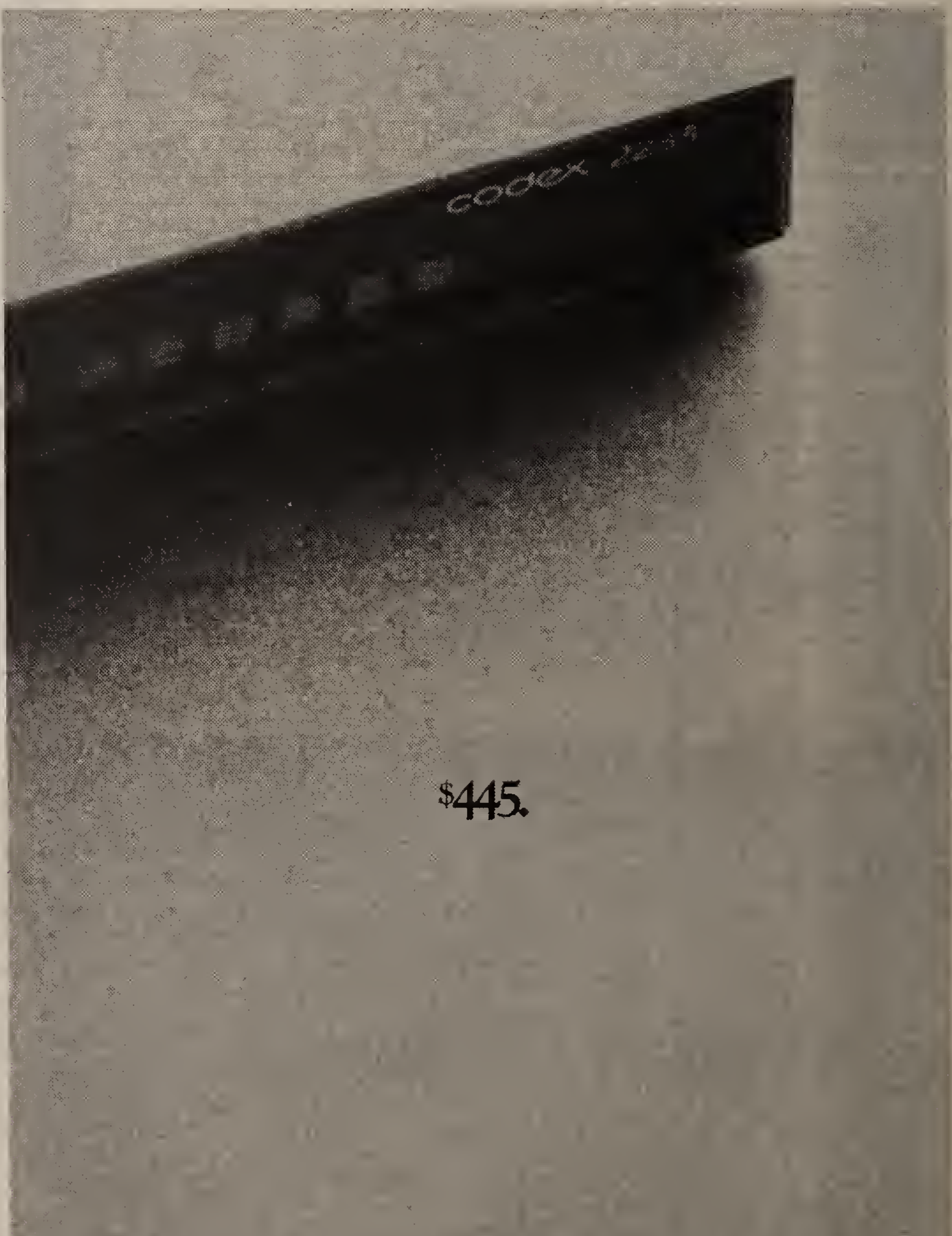

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ORACLE selected as relational DBMS by IBM for the new RT Personal Computer system

BELMONT, CA, January 21, 1986 -- The ORACLE relational database management system has been chosen by IBM for licensing on the IBM RT Personal Computer system, it was announced today. Under the terms of the agreement between Oracle Corporation and International Business Machines Corporation, IBM will market a version of ORACLE and several fourth-generation tools developed by Oracle. Under the private-label agreement, ORACLE will be called SQL/RT by IBM on the RT PC system.

This is the second such arrangement between Oracle and IBM. Three months ago, IBM announced that it would provide ORACLE under the IBM banner for its System/88 fault-tolerant computers.

Among the Oracle products included in SQL/RT and marketed by IBM on the RT PC are the SQL-compatible relational DBMS and a novice-user's interface, called Easy SQL/RT. Easy SQL/RT employs a point-and-select menu-based interface to let casual database users select and manipulate data. Easy SQL/RT users can also perform more sophisticated activities, like table creation and report generation. SQL/RT also includes an interactive command interface, a SQL precompiler for C-language programs and an online data loader for the DBMS.

According to Oracle Corporation president, Larry Ellison, "We are proud to have been selected by IBM once again as the DBMS for this IBM product line.

"We feel that IBM has a real winner with the RT PC system. We're very enthusiastic about the prospect for our products being marketed by IBM on such an outstanding new computer.

"This announcement," Ellison concluded, "further demonstrates Oracle's commitment to provide a standard solution across systems from IBM and other vendors, systems running UNIX and other operating systems, and systems ranging in size from the largest mainframes to departmental and personal computers."

The ORACLE DBMS provides a high-performance relational system across a wide range of computers and operating systems. It is marketed by Oracle and by a large number of major hardware manufacturers, including IBM, Sperry, Prime, Xerox and Honeywell. In addition to IBM's inclusion of its products in the System/88 and RT PC software portfolios, Oracle markets and supports ORACLE on IBM 43XX and 30XX mainframes with VM and MVS, and on IBM PCs with PC/DOS.

Oracle Corporation, founded in 1977, produces and markets the ORACLE relational database management system, fourth-generation software tools and decision-support software. In 1979 Oracle introduced the first commercial SQL-language DBMS. Today, in addition to the implementations on various IBM computers, ORACLE runs on DEC, DG, HP, Stratus and many other minicomputers as well as most desktop computers and micros under MS/DOS and UNIX.

Oracle distributes its products through a worldwide network of 30 direct sales offices. With its direct and OEM marketing efforts, ORACLE is used by 39 of the top 50 multi-national corporations and at thousands of sites overall.

For further information, write Oracle Corporation, 20 Davis Drive, Belmont, CA 94002, or call 1-800-345-DBMS.

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SCO tightens Microsoft bond

Aims for greater Xenix acceptance on micros

By Douglas Barney

ANAHEIM, Calif. — Aiming to make Microsoft Corp.'s Xenix operating system a more viable alternative, the Santa Cruz Operation, Inc. (SCO) last week announced Xenix-based products that work like two of the most popular MS-DOS-based applications.

At last week's Uniforum Show, SCO unveiled $795 Xenix-based clones of Lotus Development Corp.'s 1-2-3 and Ashton-Tate's Dbase II.

SCO will be selling the products into a market that has been slow to accept Xenix, a form of Unix, as an alternative to MS-DOS. "I don't believe there is any need for Unix on the desktop," said Robert Lefkowits, director of software research for Infocorp, a Cupertino, Calif.-based market research firm.

But SCO officials disagreed. "We are really looking at Xenix as not only a multiuser operating system but as an entire environment for shared information computing," said Bruce Steinberg, director of marketing for SCO.

A key to the shared computing environment was demonstrated at a joint Microsoft-SCO announcement of Xenix-Net, a Xenix-compatible version of Microsoft's network MS-Net that links Xenix and MS-DOS machines on the same network.

Microsoft and SCO announced at Uniforum that they will expand joint marketing and development activities for Xenix. Microsoft will support SCO as the major distributor of Xenix and Xenix-based applications to the value-added reseller and value-added dealer channels.

In addition, SCO was named the prime distributor of all Microsoft Xenix-based language products, although Microsoft will also continue to distribute the products.

The expanded marketing and development relations between SCO and Microsoft sparked speculation that Microsoft is not committed to Xenix. "I wonder if Microsoft is getting out of the Xenix business," Lefkowits speculated. He noted that, "Microsoft is offering all the hard parts to SCO."

Microsoft argues that the opposite is true and that the arrangements represent a broadening of the Xenix strategy. "The Xenix market is a specialized market that is clearly growing. Santa Cruz has really focused on that marketplace," said Pam Edstrom, a spokeswoman for Microsoft. "It really is just a broadening."

At Uniforum, SCO also announced the release of Xenix System V, which is also compatible with Xenix III, for the AT&T Personal Computer 6300 Plus, a non-IBM Personal Computer AT compatible.

AT&T upgrades Unix line, clarifies System V interface

By Jeffry Beeler

ANAHEIM, Calif. — AT&T last week at the Uniforum Show enhanced its Unix-based product line with an assortment of additional software offerings, including a second issue of the System V Interface Definition and two networking facilities.

Also included among the enhancements are a program that allows IBM 370-compatible processors running under VM/SP to support System V and a Japanese language interface for Unix.

AT&T also last week released other Unix-related software products:

- System V Verification Suite, a group of test programs that check the conformance of System V ports to the System V Interface Definition.
- Documenter's Workbench Release 2, which supports a number of additional document preparation features, including graphics capabilities, table creation, indexing and an expanded set of memo formats.

The second issue of the System V Interface Definition reportedly updates and clarifies the first edition, announced slightly more than a year ago, and defines five additional extensions.

One of the extensions is said to specify the user interface and run-time behavior of the basic utilities that allow users to edit text, write shell programs and manipulate files or directories.

Other extensions cover an application's terminal-handling facilities and define tools for system administration, C language programming and multiuser or multisystem communications and printer queuing.

Another of the program enhancements that AT&T released is System V-VM, which reportedly makes all the program development aids of Unix System V available to IBM VM-based mainframes. System V-VM supports demand paging, IBM 3270 emulation and the ability to communicate with other Unix systems.

On the networking side, AT&T's latest batch of Unix-oriented enhancements includes two interfaces that support the CCITT X.25 communications standard and permit the company's 3B line of processors to exchange files and electronic mail with other vendors' machines.

The second issue of System V Interface Definition requires two volumes and all together costs $57, while prices for Documenter's Workbench range from $1,400 to $2,000. Both System V-VM and the source code for the Japanese language interface, meanwhile, cost $25,000, compared with $29,000 for the System V Verification Suite.

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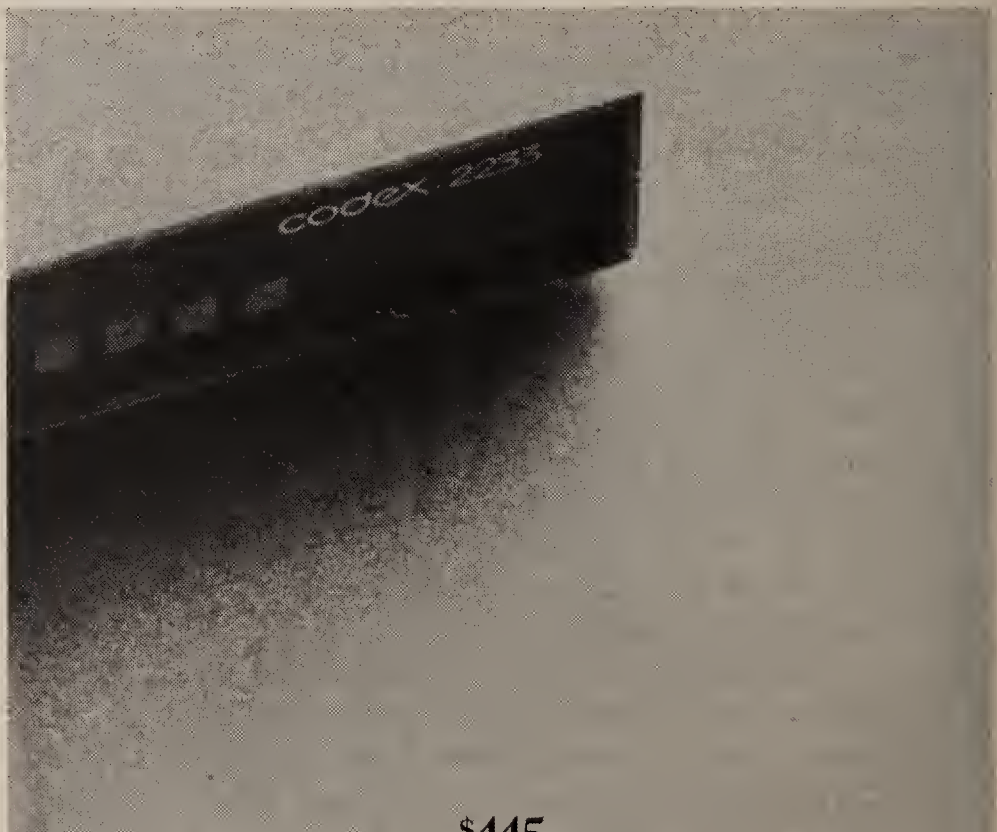

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Microsoft MS-DOS strategy features Windows way of life

Execs push system as interface standard

By Peggy Watt

SEATTLE — Applications developers who do not adopt Microsoft Corp.'s rules for the Microsoft Windows operating environment may have trouble working with future versions of its MS-DOS, company executives said last week.

Briefing applications developers in Seattle during a two-day seminar on Windows, Microsoft officials declared that Windows and MS-DOS will increasingly be intertwined.

The multitasking, multiple-window operating environment is an integral part of Microsoft's future software strategy and, the company said it hopes, eventually will be a way of life for MS-DOS microcomputer users.

Microsoft executives claimed there is room in the market for only one graphical interface package, and Microsoft plans to push Windows to the finish line.

"We're not legislating anything. We're just suggesting that unless you have a particular reason for going out of these guidelines, it would be very, very advantageous to conform," said Microsoft founder and Chairman Bill Gates.

Renee Plummer, a user support representative for AT&T's corporate headquarters, said she is looking at Windows to replace some of the variety of software the company uses now because of the consistent user interface and the potential for data transfer. "Windows gives users a visual effect and messages that are easy to understand," Plummer said.

Windows product manager Steve Ballmer urged developers to "get the religion" and to use the Windows style guide to ensure that applications will run under Windows and future versions of DOS.

"Don't do anything in Intel 8086 code if you can do it in 80286 protected mode," he said. Future versions of DOS will support Intel Corp.'s 80286 chip and will reportedly tackle existing memory limitations that currently hamper applications that run under Windows.

Future versions of DOS will likewise adopt Windows features, Ballmer said. The enhanced memory manager in the next DOS will be code brought over from Windows; it will drop software-interrupt mechanisms to adopt Windows' call-style interface.

Ballmer said developers could also make their programming lives easier by letting Windows shoulder some of the standard features and utilities.

"Much of your application time is spent writing features the operating system should write for you," he said. Turning over some of those chores to the operating environment also brings device independence, he added.

Honeywell to use NEC CPU in its high-end system

By Donna Raimondi

Honeywell, Inc. last week unveiled plans to incorporate the CPU from a newly announced NEC Corp. mainframe into its next top-of-the-line mainframe. The unnamed system, a follow-on to the Honeywell DPS 90, is under development and will be available sometime before 1990, a Honeywell spokeswoman said.

The NEC System 2000 series, announced in Japan last week, is said to be among the most powerful mainframe families in the world, with a calculation speed of up to 169M floating-point operations per second. Various models of the machine offer from one to 1½ times the processing performance of NEC's previous high-end System 1000 and exceed the power of IBM's 3090 machine, the spokeswoman said.

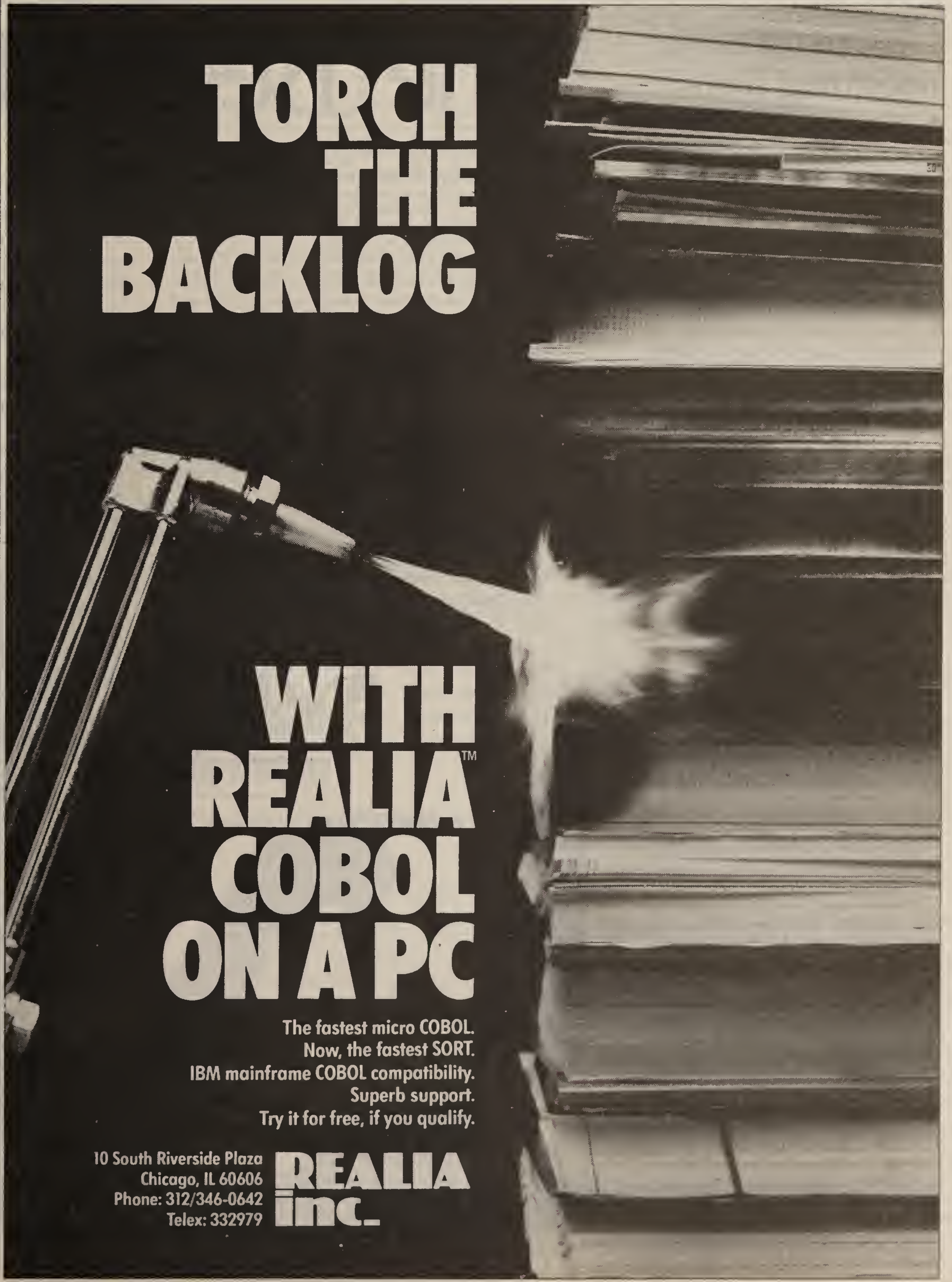
The CPU arrangement is a good deal for Honeywell customers, according to analyst Tom Henkel of the Yankee Group in Boston.

But the real issue, according to Henkel, is IBM vs. Japan. All of the viable competition in IBM's large systems arena went to Japan for help. The Japanese companies want to do business in IBM's backyard, but they cannot just hang out a shingle and declare that they are open for business. An installed user base such as Honeywell's is useful in gaining a toehold in IBM's market, Henkel added.

Honeywell and NEC began a business relationship more than 20 years ago. An additional agreement signed in 1984 provides Honeywell with rights to manufacture and market certain NEC large-scale systems. Honeywell's DPS 90, introduced in March 1985, was the first machine to integrate a NEC CPU.

It is cheaper and faster for Honeywell to use technology developed by NEC for its high-end systems, the Honeywell spokeswoman said. Other series, like the DPS 8 mid-range systems, do not employ NEC CPUs.

NEC introduced four models of its high-end System 2000 series, with shipments scheduled for June 1987.



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San Francisco man found guilty in software piracy case

Copyright violation brings federal charges

By James A. Martin

SAN FRANCISCO — A San Francisco man was recently found guilty on all counts in a software piracy case that is believed to be the first involving federal criminal charges.

A jury found Thomas Taylor, 60, guilty of five criminal counts following a five-day trial that concluded Jan. 31 in U.S. Magistrate's Court in San Francisco. Federal criminal charges were filed against Taylor in U.S. District Court last September. Taylor reportedly illegally reproduced and distributed at least two copies of Cimarron 4.0.3, a court reporting software program authored by Stenograph Corp. of Skokie, Ill. [CW, Oct. 28].

Taylor's attorney, Jeffrey G. Nevin, said a motion for acquittal was requested last week, with an appeal to be filed following sentencing March 21 by U.S. Magistrate Frederick T. Woelflin.

"We are obviously pleased to see the federal government become involved, and we're equally pleased to see a conviction because it lends credence to the fact that this is a serious crime and should be treated as such," said David B. Sturtevant, senior director of public communications for the Association of Data Processing Service Organizations, Inc. in Arlington, Va.

"I suspect this is the beginning of what will be more federal prosecutions in this area," Sturtevant added.

Taylor was found guilty of one count of reproducing copyrighted software for "commercial advantage and private financial gain," one count of infringing the copyright of the user's manual by reproducing and distributing the manual, two counts of distributing a diskette containing the reproduced software to two individuals and one count of illegally removing the copyright notice that appears on the software.

A retired businessman, Taylor sold discontinued Texas Instruments, Inc. small computer systems to six or more users of the Cimarron program, according to attorney Nevin. Taylor was not an authorized representative for TI but purchased and sold several systems at a discount.

Stenograph at one time bundled its software with TI's DS900/1 and Business Systems 250 small business systems but later upgraded to Digital Equipment Corp.'s Professional 350 and Professional 380 series of workstations, according to Edward H. Kight, Stenograph president.

The maximum penalty for the first four counts is one year in prison and/or a $1,000 fine and for the fifth count, $500.

Groups question operating firms' business dealings

By Bryan Wilkins

WASHINGTON, D.C. — In an effort to determine whether divested Bell operating companies are using postdivestiture rate hikes to underwrite subsidiaries involved in competitive ventures, two monitoring groups last week requested copies of Federal Communications Commission documents pertaining to those subsidiaries.

A formal request for documents, under the provisions of the Freedom of Information Act was filed by the North American Telecommunications Association (NATA), which represents independent equipment manufacturers, and the Consumer Federation of America, which represents consumers.

"There's increasing evidence that the operating companies are using their multibillion-dollar profits from local phone service to underwrite their risky, competitive offerings," said Edwin Spievack, NATA president.

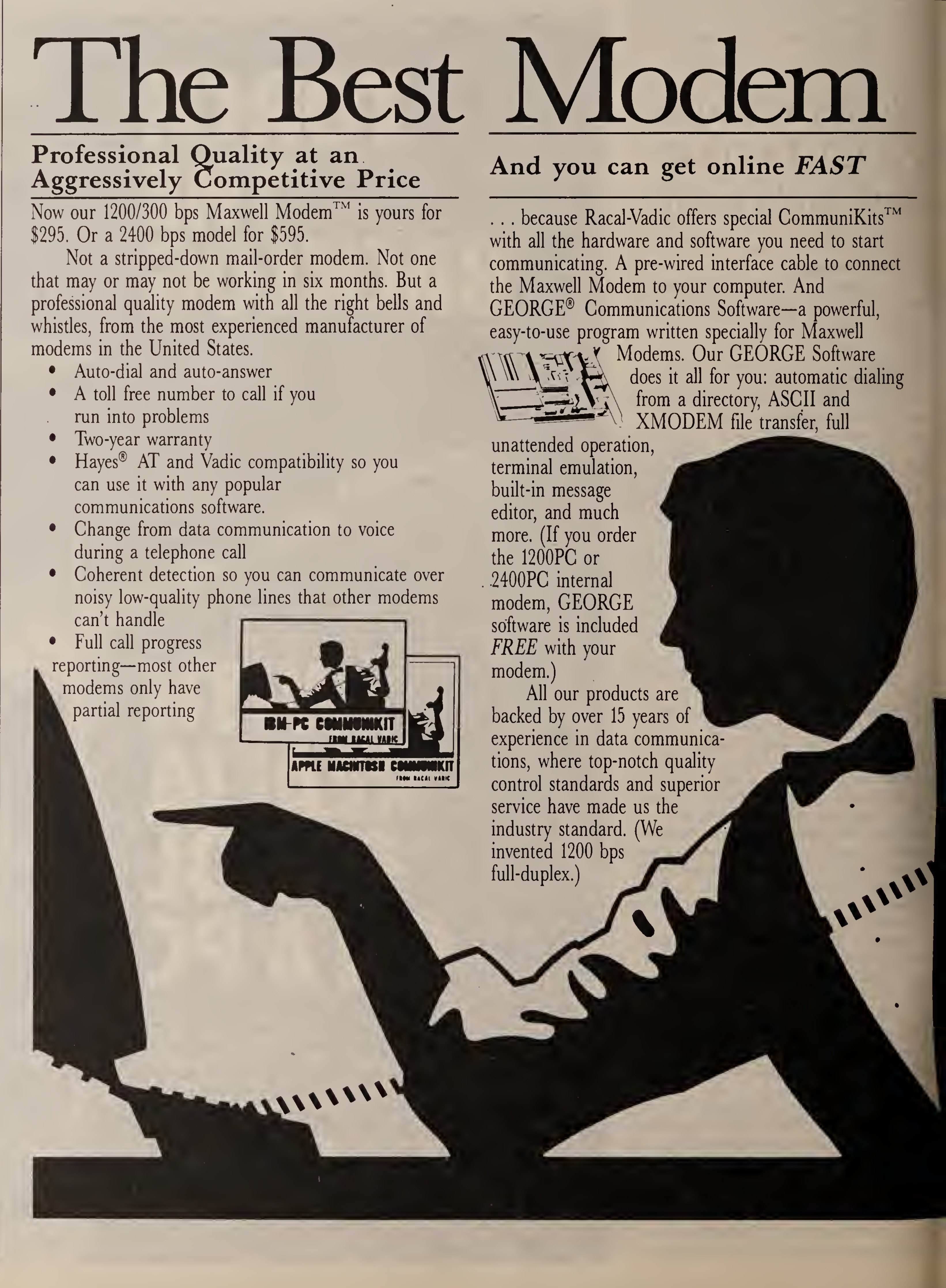
FCC monitoring powers in question

Spievack said the request for documents relating to the the formation of the operating companies' subsidiaries will be used by NATA and the consumer organization to see whether the FCC is adequately monitoring transactions between regulated telephone service and unregulated equipment ventures.

Albert Angel, an attorney representing NATA said there is urgency in the request for documents because the former Bell operating companies are seeking FCC permission to merge their unregulated equipment subsidiary sales forces into the regulated service branches of telephone service.

"What we're asking for no one has yet asked. Are the operating companies' subsidiaries profitable? We have anecdotal evidence they are not. And we think the FCC is moving too fast to change the underpinnings of the divestiture decree. It is offering only generalities and no specifics for its shift," Angel added.

The FCC had no comment on the request filed by the two groups.



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Datagate suit charges HP with unfair business practices

WEST COAST UPDATE

MILPITAS, Calif. — Portraying itself as the mouse that roared, a maintenance firm in Milpitas is suing nearby Hewlett-Packard Co. in U.S. District Court on charges that HP is trying to run the firm, Datagate, Inc., out of business.

The 105-employee Datagate, which has specialized in repair and maintenance of HP hardware since its founding in 1978, contends that HP sales and engineering staff have told Datagate customers to opt for maintenance contracts directly from HP. The HP representatives, according to Datagate, said that the smaller company would no longer be able to obtain replacement parts and to repair HP equipment and would soon be out of business.

Datagate requested a halt to HP's alleged practices and at least $35 million in actual and punitive damages. HP declined to comment on the issue.

Datagate has sales of less than $10 million, while HP employs some 84,000 people and had sales of $6.5 billion last year.

■

CUPERTINO, Calif. — Hewlett-Packard Co. is reportedly readying a marketing and promotion plan to broaden the base of target applications for the firm's recently announced Vectra microcomputer.

HP will soon announce its intention to adapt Vectra to address the desktop publishing field. Shortly thereafter the company will also disclose a similar plan to optimize the product for the computer-aided design (CAD) sector, according to Bill Murphy, marketing manager for HP's Personal Computer Group.

Under its soon-to-be-announced marketing strategy, HP will identify five levels of user needs within the desktop publishing field and offer a different Vectra and Laserjet configuration for each, Murphy said.

The plan signals a marked expansion in applications focus for Vectra, an IBM Personal Computer AT look-alike that HP initially positioned for standard office automation tasks such as word processing. Vectra was introduced last September.

The impending announcement of HP's expanded marketing push reflects the vendor's growing desire to shun the "box mentality" in its micro activities and to promote Vectra as a solution to user problems, Murphy said.

"Having a better box is necessary but not sufficient" for penetrating vertical market niches like desktop publishing and microcomputer CAD, he said.

■

SAN FRANCISCO — Pactel Infosystems, the retail telephone and computer sales arm of Pacific Telesis Group, is doing its share to fight hunger and homelessness by contributing a business telephone system to the Los Angeles headquarters of Hands Across America, a project of USA for Africa.

The Pactel Series 400 key system, which supports 48 phones, will be installed at Pactel Infosystems' expense and will be used to coordinate a fund-raising project this summer. The Hands Across America project will collect money by pledges when more than five million people will link hands across a 4,000-mile route from New York to Los Angeles.

Hands Across America project director Fred Droz said the system will be used to coordinate information requests and promotions and help develop the enormous data base needed for the hand linking to fight hunger.

— Jeffry Beeler and Peggy Watt

Unix effort joins Apollo, AT&T

By Rosemary Hamilton

CHELMSFORD, Mass. — Apollo Computer, Inc. announced last week that it plans to work with AT&T in a development program involving AT&T's Unix System V operating system. In addition, the company signed a joint marketing agreement with Omnicad Corp., which is partly owned by AT&T.

An AT&T spokesman said the agreement is an endorsement of System V and bolsters the operating system's position as an industry standard.

Apollo will enhance its Domain/IX operating system, which was announced last year, so that it conforms to the AT&T System V Interface Definition using the AT&T-supplied System V verification suite, a company spokesman said. Domain/IX is based on System V, but Apollo also offers the University of California at Berkeley 4.2 version of Unix on its systems. The company said it would incorporate features from the upcoming release of System V, such as AT&T's transparent file sharing facility.

Apollo and Omnicad will jointly market AT&T applications software developed by Omnicad. The companies have initially targeted the electronic design and technical publishing markets.

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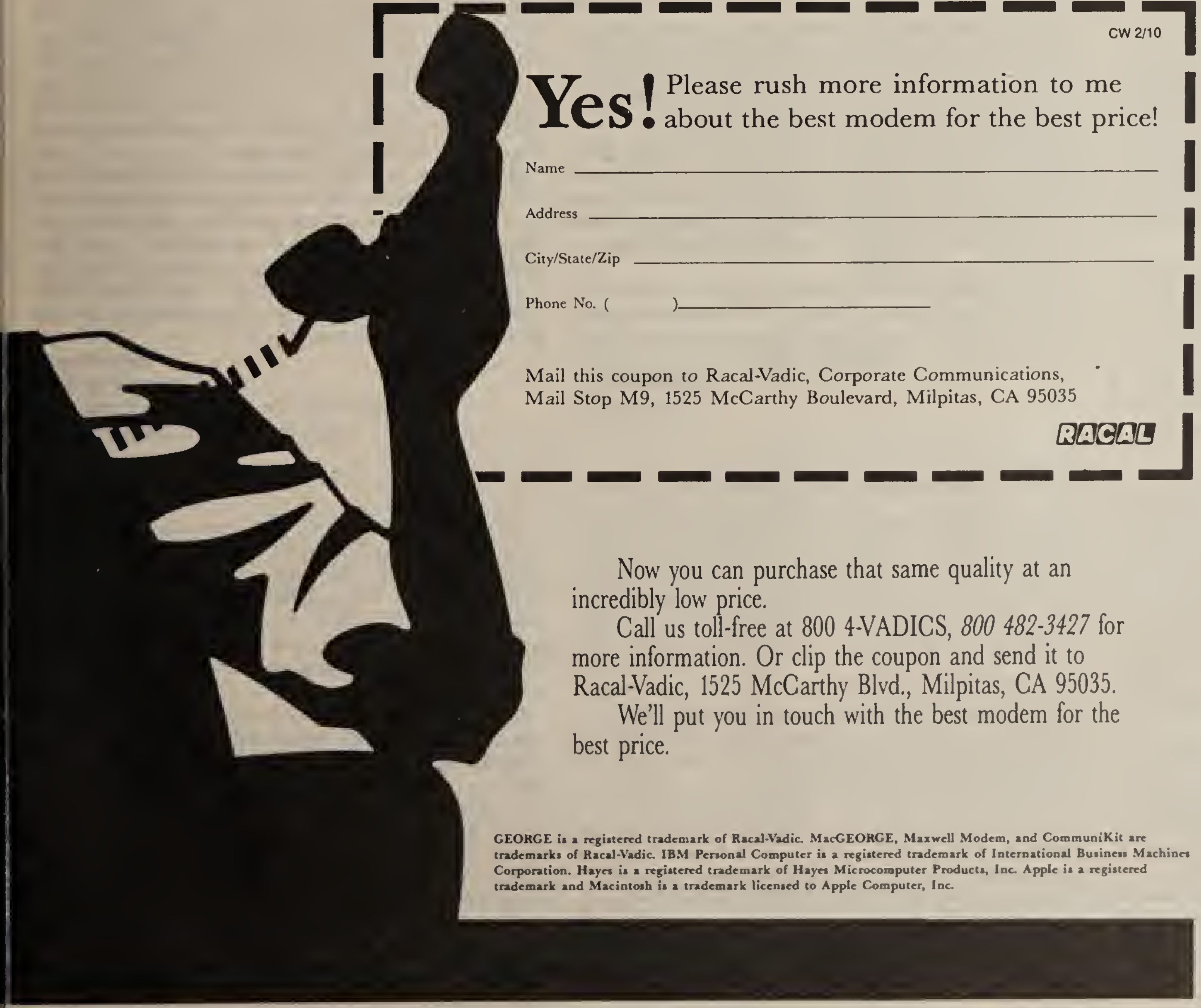

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VIEWPOINT

EDITORIAL

Same time next year

Each year since its launch in 1982, Uniforum Show, the annual gathering of Unix aficionados, gives new fire to the continuing debate over the fate of Unix. Walk the floors of the convention center in Anaheim, Calif., eavesdropping on the palaver of the 12,000-plus buyers, sellers and potential users, and hear many attendees trumpeting "*the year of Unix*," the point in time when the 16-year-old operating system from AT&T Bell Laboratories finally makes its way out of its relatively narrow niche of research and technical applications and into the much larger marketplace of business applications.

There are usually some signs that lend credence to the prediction. In 1983, it was AT&T's announcement of its Unix System V that was said to establish finally a standard among the myriad versions of Unix that have emerged over the years. In 1985, it was IBM's announcement of Unix products for its mainframes and micros. This year, it is Big Blue's presence at Uniforum for the first time.

Meanwhile, critics contend that the predicted explosion of Unix into the corporate world is sure to fizzle, citing unresolved problems: no commanding Unix standard and the resulting reluctance of vendors to develop applications software, the sophisticated tinkering necessary to achieve Unix's much-lauded connectivity among all sizes and types of machines and a complex command structure that only programmers can love.

Fans counter that no other operating system can run on virtually everything from a personal computer to a Cray Research, Inc. Cray 2 or can offer such a range of sophisticated development tools. They also say that the actions of, first, AT&T and, now, IBM prove that the market is standardizing around the System V version of Unix, thus guaranteeing its eventual widespread acceptance in the corporate world. Sure to follow, they add, is a plethora of truly useful applications packages.

Typical of such debates is a fair amount of hyperbole on both sides. Certainly Unix, especially its System V version, has impressive potential as one solution for companies that need to link users of personal computers to one another and to a larger mini or mainframe. It remains only one solution, however, one that has far more potential than performance.

There *is* evidence that vendors now realize that the commercial marketplace is where Unix will either grow and thrive or fail and shrink back into its research niche. Whether they can forge Unix into a truly useful tool, one that provides clear solutions for business users, is still in question. That will not occur until one clear standard is embraced by all major vendors, and each system vendor that chooses to layer its own enhancements atop Unix further discourages users from investing in Unix products.

Ultimately, the success of Unix will depend on the same factors that determine the success of any product: Can it gain a sufficient, sustained market share that is built on a satisfied customer base and that has continuous product support and improvements?

That seems doubtful. Unix accounts for a tiny fraction of the installed base of commercial operating systems, and the odds of its displacing its competitors seem slight indeed. One thing is certain: This is certainly *not* the year of Unix. We'll tune in again in 1987.

NO PROBLEM. I'LL JUST PULL OUT THE OLD ENGINE AND POP IN THE NEW. COME BACK IN A COUPLE OF HOURS.
DAV S
VAX 8000
DEC

LETTERS TO THE EDITOR

Theory pinpoints relational rationale

Any of us who follow a system development life cycle go through a phase called "design alternatives." Here, we compare alternative designs not against each other but rather against the proposed system's business requirements. At least in theory we do.

There is a parallel in the E. F. Codd-Cullinet Software, Inc. controversy. Codd, in a two-part article, "Is your DBMS really relational?" [CW, Oct. 14; Oct. 21], reiterated the rules he formulated for the relational mode, giving Cullinet's IDMS/R a failing grade in respect of following them.

Codd can be likened to a business manager presented with several system proposals, which can be likened to the relational DBMS products now on the market. A business manager has the prerogative to decide how well a system will meet the requirements — if at all.

The relational DBMS vendors are probably justified in arguing about whether their products can get the job done. At the same time, Codd is justified in stating what "the job" really is.

William Takacs
Harrison, N.Y

Relocating ought not break the bank

In the article on Bank America Systems Engineering group's relocation to Concord, Calif., "Staff relocation provokes angry response" [CW, Dec. 16], there is ample suggestion of alleged problems associated with the relocation, but it offers neither facts nor named sources to support the varied claims.

In the story, there seemed to be a particularly timid group of ex-employees and current staff — not to mention three uncharacteristically reticent executive recruiters — who were interviewed but declined to be quoted by name.

For the record, we don't expect a relocation of this scale and scope to be completed without some displeasure from some quarters, but we've done a great deal of thoughtful planning to mitigate the difficulties. We expect the facility, when completed at the end of this year, to be a thriving, vibrant community.

R. J. Harrison
Senior vice-president
Bank America Systems Engineering
San Francisco

DP buzzword needs reconsideration

Allow me to offer some thoughts in support of the reader's platform, "A plea to stop using 'user' " [CW, Jan. 27].

I, too, have long been in favor of dropping the use of the term "user" because of its connotations. Suggested alternatives include "customer," "client" and, my particular favorite, "owner." All three terms have one thing in common: They correctly identify the people and organizations that are footing the bill for the system's development and will continue to have an active relationship with the new system after the developers have moved on to the next challenge.

Too often in data processing we consider our function as an end in itself rather than as a means to an end. In some companies, 100% of DP costs are allocated to functional departments. Does this mean that DP doesn't cost the company a cent? No, it merely reinforces that DP is a service organization and that the functional departments are the true owners of the systems.

Jim Williams
Lead systems analyst
United Services Automobile Association
San Antonio, Texas

■

Data processing has always been a jargon-intensive profession, and much of the jargon makes a statement about MIS attitudes. Take the word "proliferation." When MIS brings in personal computers, that's OK. When users do it, it's proliferation. The reader's platform, "A plea to stop using 'user' " made some good points about the leading offender, "user."

Unfortunately, end-user computing has complicated the issue as the boundaries between user and programmer become increasingly fuzzy. After all, when a programmer runs a personal computer spreadsheet, isn't the programmer, strictly speaking, a user? And in some companies, users who develop personal computer applications are beginning to push for the title, salary and status of programmers.

Alternatives to "user" are limited. "Client" and "customer," the most frequently suggested alternatives, make sense only in certain situations. If a person who requests personal computer support from MIS is a customer, what then do we call the

See **DP** page 18

WEEKLY.

THE NEWSWEEKLY FOR THE COMPUTER COMMUNITY

COMPUTERWORLD

IBM users confused by net reversal

'Get tough,' DPers urged

Apple push on for more system links

Improved Mac, IBM, DEC compatibility is targeted

TOP OF THE NEWS

CW EXCLUSIVE

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COMPUTERWORLD

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   - **65.** Public Utility/Communications Systems/Transportation
   - **70.** Mining/Construction/Petroleum/Refining/Agriculture
   - **80.** Manufacturer of Computers, Computer-Related Systems or Peripherals
   - **85.** Computer Service Bureau/Software/Planning/Consulting
   - **90.** Computer/Peripheral Dealer/ Distributor/Retailer
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   - **95.** Vendor: Other ______
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   - **E.** Office Automation Systems

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VIEWPOINT

The impact of Star Wars on MIS

LECHT ON SCIENCE

By CHARLES P. LECHT

Twentieth century human beings too often need preparation for war or defense to serve as a stimulus to get on with the kind of scientific research that President Reagan's Strategic Defense Initiative — popularly called "Star Wars" — requires. However sad it is that it originates in our need to defend ourselves, Star Wars research will create a mammoth reservoir of new technologies that will benefit us all.

It should come as no surprise that Star Wars research in such fields as physics, chemistry, metallurgy and mathematics is the same as that required in our computer and communications industries.

Stationing laser weapons in space and controlling these weapons to zap incoming missiles while not zapping ourselves will require incredibly sophisticated information processing systems.

Ironic as it may be, studying the means to create the laser weapon ray — the "death ray," as it is called by some — to do the zapping may yield results that are of greatest benefit to computer and communications users alike. Why? Because the perfection of laser technology will take us a long way toward holography.

Systems that can produce holographic imagery stand at the end of the road along which all the meaningful signposts of our computer and communications technologies have been pointed since their beginning. Through holographic systems we obtain the capacity to reproduce reality — what happened, what is happening and what is going to happen — and to convey its message expertly.

To say simply that the creation of holographic systems is the final goal of all information processing systems development only begins to suggest its importance to us. As I see it, without these we're lost. Our natural perceptive and cognitive facilities are as woefully lacking as is our physical strength. Without augmentation of these, we cannot hope to cope with the complex problems that life routinely presents.

The first step in the creation of holographic systems is the development of high-density holographic memories. Making such memories requires that we develop ever finer ways of engraving circuits on chips. New laser technologies — that hurl streams of particles of ever-decreasing cross section with ever-increasing speed and accuracy onto the silicon turf of which our chips are made — can help this come about.

> ”
>
> ***Star Wars research will create a mammoth reservoir of new technologies that will benefit us all.***

The Star Wars research program for laser beam development will help crack the current micron (millionths of a meter) circuit width barrier so that circuits may be created whose cross sections are measured in fermis (trillionths of a meter).

Think about it: On a chip the size of those currently housing 256K-byte memories and employing approximately 1-micron circuits, even circuit cross sections of 1,000 fermis — one billionth of a meter — could increase the volume of data that could be put on the same silicon wafer to 256 million bytes or thereabouts.

The term "holographic" as applied to memories is used to convey their nature as essentially fail safe. At each point in the physical memory is the entire data base. Should any part of the physical environment of which the memory is made become disabled, no data is lost.

Employment of massive holographic memories in future computer systems will create a revolution in the ways we use computer technology. Imagine systems that are capable of containing everything we may wish to record on-line in a fail-safe environment so that past results can contribute equally with current findings in the creation of plans.

And it is not only memories that will be revolutionized by improved laser technologies; processors are likewise affected. The smaller the circuits, the more that may be engraved in the same space. Because two-thirds of the delay in processor speed may be traced to interchip communications, the fewer chips employed, the faster the system.

Incredibly fast processors and vast fail-safe on-line memories are a prerequisite to development of holographic information systems and our obtaining the benefits these may bring. In their capacity to reveal truth that appeals to all our cognitive senses, they give us better evidence to weigh before acting. Ironically, holographic systems — the possible offspring of Star Wars reserach — could take us a long way toward the alleviation of the madness represented by the sorry image of 20th century people all over this globe preparing defensive systems to ward off real, imagined or contrived threats from others.

Lecht is chairman of Lecht Sciences, Inc., a New York-based think tank specializing in computer and communications technologies. He divides his time between Tokyo and New York.

Ada: A better choice

READER'S PLATFORM

By BENJAMIN M. BROSGOL

Ada has been a subject of attention for about 10 years as it has progressed from a list of requirements through several design iterations to a standardized language implemented on a wide range of machines.

Most people are aware that Ada was designed for the development of real-time systems. Perhaps less well known is the fact that it can be, and is, used for much more. The problems that motivated the design of Ada — high costs in the maintenance part of the software life cycle — are not unique to real-time applications. Rather, they are characteristic of any software project that has to produce a large and long-lived system.

Languages and tools that work for systems of a few thousand lines are not necessarily effective when the size increases by five- or tenfold. Ada provides the kind of functionality to address these problems head-on.

Ada is being used for real-time systems, of course. Boeing Computer Services Co. is using Ada for commercial aircraft development. The Federal Aviation Administration is developing its next generation of air traffic control systems in Ada. The National Aeronautics and Space Administration has selected Ada for the Space Station project.

Robotics applications are being programmed in Ada at the University of Michigan. And there are many more organizations, both in the U.S. and abroad, that have chosen Ada because it is the best candidate, not because they have been told to use it.

Beyond real-time systems, Ada is being used in a wide range of environments. Libraries have been and continue to be developed for scientific and graphics applications. Data bases and interfaces to existing data bases are being written in Ada.

Even in artificial intelligence and business data processing, historically one-language applications, we are seeing Ada making inroads.

Ada is here, in use now, and its use will continue to grow. It is a standardized language with production quality, validated compilers and supporting tools from a wide variety of vendors. It is available on popular machines, including microprocessor-based workstations, and on common operating systems.

Efficiency? The results have been extremely encouraging. Benchmarks have shown that Ada can be as efficient as C and Pascal, or more efficient, and these tests were performed using commercial compilers to do the comparison.

See **ADA** page 18

Brosgol is vice-chairman of the Association for Computing Machinery's Special Interest Group on Ada.

Resolving productivity problems

READER'S PLATFORM

By JOHN CALLAHAN

For the past 20 years, programming productivity has remained an unsolved problem, and, as was noted in a recent *Computerworld* article, "Programmer productivity" [CW, Dec. 30/Jan. 6], all efforts to find a panacea in a technical package or techniques have failed. In addition, 50% of programming activity is being spent on maintenance changes to systems.

What continues to amaze me is the tenacious belief that technology development will produce new tools to solve the production issue after 20 years of failure in this area. When artificial intelligence and voice command breakthroughs have reached the point where combinations will generate error-free logic flows and program code, then such tools should significantly reduce productivity backlogs.

Production depends upon the efforts of persons directed toward creating desired product results. In the process, tools of various kinds are usually employed, but it still requires the efforts of *people* to achieve production results. The focus on technical tools as a cure for backlogs has only led to a detour that avoids the real problem — the people problem.

People produce the most output when they work at those activities they thoroughly enjoy. This is a fact of working life, whatever the job tasks or the job level.

Matching people to jobs

Is it not, then, one of the basic responsibilities of professional managers to determine the kinds of tasks their employees really enjoy and then try to match people to jobs?

Is it not also one of the factors of management to have enough awareness of burnout symptoms to be able to recognize them as they develop and to try to defuse those symptoms before the department faces turnover of 25% to 45% and applications backlogs of two to four years?

Yet, managers in DP, with rare exception, know very little about motivation, treating it as an abstract theory. They know even less about burnout, treating it as a myth. Left unaddressed and uncorrected, these two issues alone will assure low production no matter what tools of technology are supplied. The refusal to face these issues is the failure of management, or the evidence of mismanagement.

Another very distressing fact that indicates further mismanagement is that 70% of programming efforts are

See **SOLVING** page 18

Callahan is an author and a consultant in data processing, based in Arlington, Texas.

Solving problems

From page 17

spent on maintenance work. Doesn't that signal that too little effort is being made in front-end systems development with too hasty a jump into programming before the general and detail design specs have been completed?

A satisfactory, normal effort for life cycle development should require 45% to 50% for general and detail design specs with emphasis on the general; 35% effort for programming, testing and debugging; and 15% to 20% for implementation and training. To spend less than 45% to 50% of effort to develop the system specs is to undersell, to underbuild or to underdesign the system. When 70% of the effort is needed for maintenance, too little effort is being expended to develop the general and detailed design specs.

The control of the efforts, the scheduling allowed and the extent of developmental fact gathering are directly under management. The sorry record here indicates even more clearly that this is another case of mismanagement.

However painful it might be for management in DP, those and many other issues of mismanagement are going to have to be confronted someday, and steps will have to be taken to correct them. As conditions indicate, the toll for mismanagement is becoming worse with each passing year.

Technology developments will not provide solutions for low productivity. Learning and applying the principles of professional management on a daily basis will greatly alleviate these problems, which are people problems and have been people problems from the start.

Ada: A better choice

From page 17

Portability of programs? This has been a problem for our industry ever since the second computer was invented. There are many ways in theory to approach it, including various hardware innovations; but in spite of this, the issue has not and will not disappear.

One should always be skeptical of claims of easy solutions to well-known hard problems, and Ada does not claim to offer any magic here.

On the other hand, its combination of a single, nonsubsetted standard language, together with specific features that enable a programmer to avoid host and target dependencies, make portability more realistic than for any other programming language.

As a case in point, Alsys has written an Ada compiler system and some supporting tools that comprise more than 300,000 lines of Ada code and has successfully moved it from a DEC VAX/VMS environment to a Motorola, Inc. 68000 on Unix and to an Intel Corp. 80286 on DOS in a time frame that would have been unachievable had any other language been used.

Attending one of the meetings of the Special Interest Group on Ada that are held several times a year provides ample opportunity talk to vendors and users of Ada products to learn about the language and its applications and to write and run Ada programs using commercially available compilers.

DP buzzword reconsidered

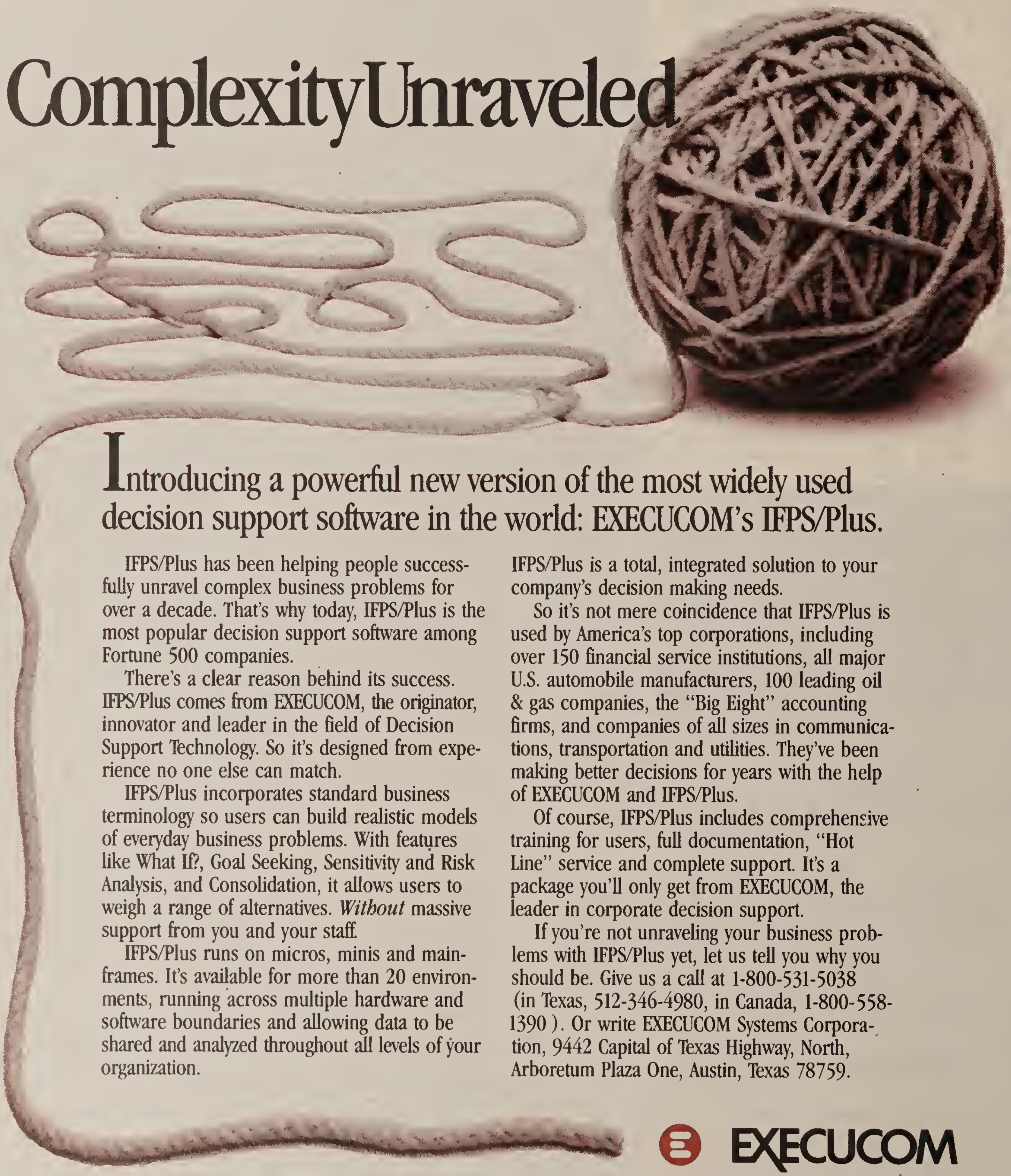
From page 16

nontechnical person who is smart enough to figure it out without MIS hand-holding?

What is needed is one buzzword to describe everyone who uses a computer to develop or run business applications. What about "computer users"? Computer user can encompass both technical and nontechnical people. It can apply whether the person is in a Fortune 500 corporation or at home.

By being compressed into jargon, it avoids the addictive connotation of the terms it replaces while remaining appropriately mystifying to the outside world, as all good jargon should.

Naomi Karten
President
Karten Associates
Randolph, Mass.



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SYSTEMS & PERIPHERALS

SHOP TALK
Peter Cooperstein

IBM Credit at crossroads

IBM Credit Corp. has come a long way since it introduced its leasing program to IBM equipment users in 1982. The questions are whether it is still traveling in the direction it started out in and whether the course is the smart one for IBM.

When the IBM Credit lease hit the marketplace, I was an IBM representative specializing in financial marketing. IBM had already begun to guide customers away from its own monthly rental and two-year lease plans (the company's version of rent to own) and to encourage, instead, outright purchase and third-party leasing in which an independent leasing company buys equipment from IBM and leases it to the user, typically for two to five years. Then, with IBM Credit, it seemed that IBM was simply out to offer its users just another solid, if unaggressive, financing option.

At the time it appeared that, although IBM Credit would not come out on top in many competitive situations, it would serve IBM well. It would be available when most other leasing companies were either unimpressed with the user's creditworthiness or unexcited about leasing a particular IBM product. For example, a third party would hardly take an aggressive position now on IBM 3080 processors, a technology near the end of its life cycle. The bottom line for IBM, after all, was to make

See **IBM** page 22

Cooperstein is vice-president of marketing for Western Marketing and Financial Corp., a San Francisco-based leasing and brokerage firm.

Fiscal woes smother HEP-1

Little hope for long-praised Denelcor supercomputer

By Mitch Betts

For years computer scientists praised the HEP-1 supercomputer for its advanced parallel processing architecture, but now they are pulling the plugs on the few installed machines.

The bankruptcy status of the manufacturer, Denelcor, Inc. of Aurora, Colo., makes it unlikely that technical problems with the hardware and software will ever be solved.

Shutting down operations last October, Denelcor left behind at major U.S. research facilities a small group of users who greatly admired the architecture of the 64-bit HEP-1 — the first production multiple-instruction, multiple-data-stream machine — but who criticized its terribly slow speed and software bugs.

Users interviewed by *Computerworld* said they have unplugged the machine, partly because of the technical problems and partly because they don't expect to get sufficient vendor support now that Denelcor is moribund under Chapter 11 of the Federal Bankruptcy Code.

Denelcor, Inc. HEP-1 users

Los Alamos National Laboratory, New Mexico *(leased)*

U.S. Army Ballistics Research Laboratory, Maryland *(leased)*

National Security Agency, Maryland *(leased)*

Argonne National Laboratory, Illinois *(tested for 2 years)*

University of Georgia *(tested for 1 year)*

Messerschmitt-Bolkow-Blohm GmbH, West Germany *(purchased)*

Shoko Co., Japan *(purchased demonstrator, 1984)*

CW Chart

Computer scientists had great hopes for the Heterogeneous Element Processor (HEP) architecture and were disappointed by Denelcor's severe financial, management and technical problems. "The implementation was not as good as the theory," concluded Ann Hayes, leader of the computer research and applications group at Los Alamos National Laboratory in New Mexico.

The HEP-1 at the U.S. Army's Ballistics Research Laboratory in Aberdeen, Md., was unplugged recently, in part because of the bugs in the operating system. "We're kind of hesitant to use that space in the computer room for a system that doesn't have any kind of company support," added Jack Brown, electronics technician at the Army lab.

Bill Barkuloo, a former engineering team leader at the Army's ballistics lab, said the HEP-1's architecture is closer to embodying true parallel processing than others on the market, but he criticized Denelcor for being unable to fix the bugs in its Unix-compatible operating system called UPX.

"If someone doesn't pick up this architecture, it will be quite a loss to the computer community and hurt the U.S. competitive position vs. Japan," he said.

Barkuloo said the HEP-1 was designed under a research and development contract awarded by the Army ballistics lab, which is famous for a similar research and development contract that produced in 1945 Eniac, the first large digital computer. The first HEP-1 was delivered to the Army in December 1982.

Denelcor's losses have been blamed on a variety of financial and management problems: the firm's inability to compete with Cray Research, Inc. and other supercomputer vendors, problems with the HEP-1 software, lack of funds to produce a faster HEP-2 and the computer industry slump of 1985.

The firm ceased operations in October [CW, Oct. 26], laid off its employees and is now proceeding under Chapter 11, according to William D. Scheid, an attorney representing Denelcor in the bankruptcy proceedings.

Denelcor reportedly had accumulated about $34 million in losses from 1981 to mid-1985 and had never made an annual profit.

See **FISCAL** page 24

INSIDE

Users and resellers say they want still more from the IBM System/36 PC/**25**

NEW THIS WEEK

- Hewlett-Packard enhances dot matrix printer line
- Zitel offers memories for Perkin-Elmer 3200 systems
- For more on these and other new products, see pp. 99-128.

INSTANT ANALYSIS

"The implementation was not as good as the theory."

— Ann Hayes, of the Los Alamos (N.M.) National Laboratory, discussing the Denelcor, Inc. HEP-1 supercomputer

HARDWARE NOTES

Flagging demand seen for 3090

IBM's 1985 financial results were still the subject of speculation last month when analyst projections for 1986 results became public. **Paine Webber, Inc.** analyst **Jonathan Fram**, citing a survey by **Computer Intelligence Corp.**, predicted that demand for IBM's flagship **3090** processor has peaked and will drop in early 1986 with a resultant drop in IBM earnings in the fourth quarter of 1986.

■

Intel Corp. recently said that 30 more independent manufacturers announced plans for 45 products based on Intel's **Multibus II** architecture. That brings to 92 the number of Multibus II products Intel expects to be introduced in 1986. In addition, Intel identified five major companies that have selected Multibus II for future products.

■

The very large-scale integration (VLSI) **Graphics Processor Extended** (GPX) chip used in **Digital Equip**
GPX was one of a number of chips developed under the code name **"Dragon"** at the company's **Hudson, Mass.**, semiconductor facility. "The development of the GPX chip took so long that some people thought the code name was Drag On," **DEC President Ken Olsen** said.

■

Flexible Computer Corp. in **Dal-**

See **NOTES** page 24

Motorola unveils multiuser system to rival VAX-11/780

By James Connolly

PHOENIX — Motorola, Inc.'s Microsystems Operation recently introduced two Motorola VMEbus-based systems designed as expandable core configurations for the OEM market and as software development systems.

The System 1121 and the System 1131 are intended to offer performance that rivals the Digital Equipment Corp. VAX-11/780 while running Motorola's System V/68 operating system, which is said to be functionally identical to AT&T's Unix System V.

The System 1121 is powered by the 16-bit Motorola 68010 processor, and the System 1131 is powered by the 32-bit 68020.

A Motorola spokesman said that typical applications include industrial automation, data communications and image processing and that the basic systems can be customized for various applications through the addition of special-function VME boards produced by Motorola and 250 other manufacturers of VMEbus-compatible products.

The systems feature Winchester disk drives and floppy disk drives, dynamic random-access memory, a system controller, RS-232C serial ports and expansion slots for up to five VMEbus modules in the System 1121 and up to four modules in the System 1131.

The System 1121 costs $12,495, and the System 1131 costs $14,995.

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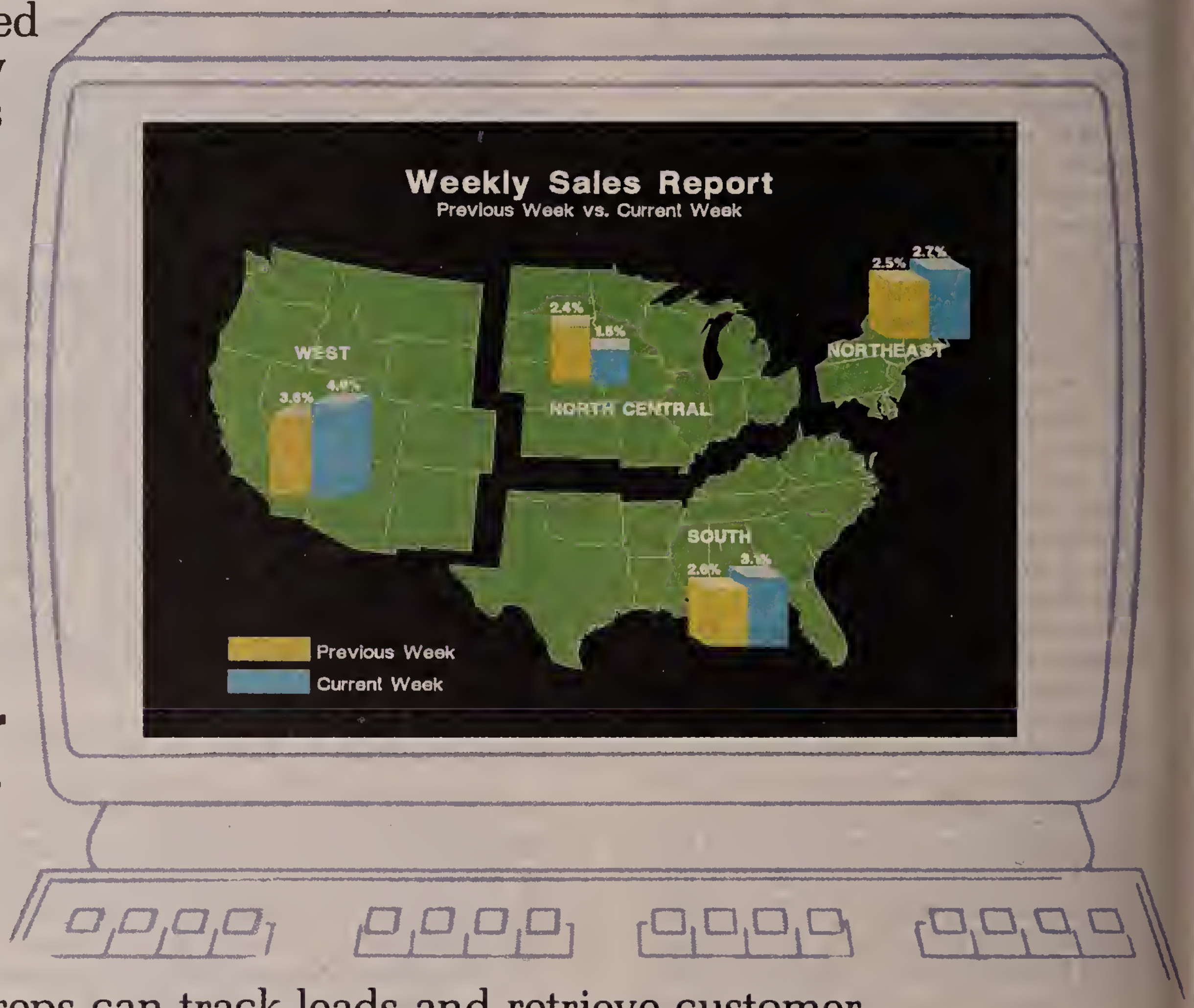

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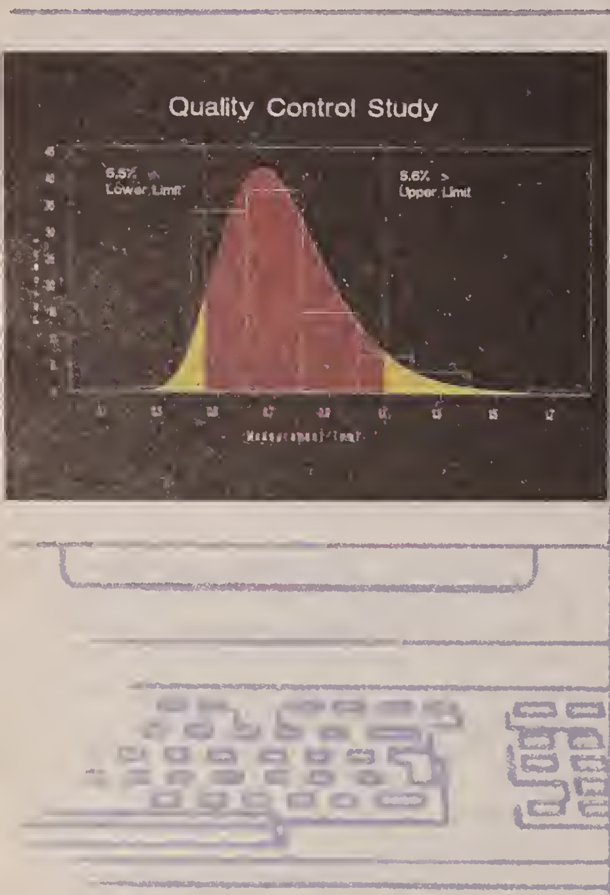
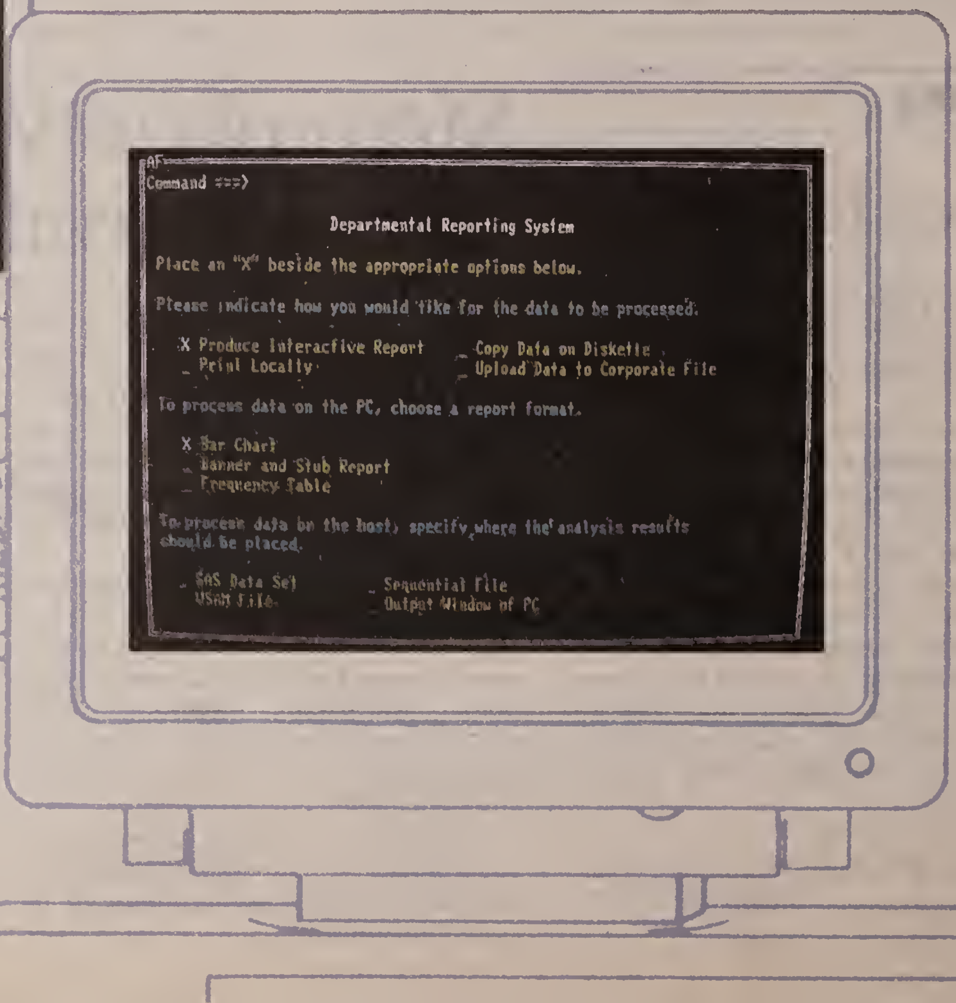
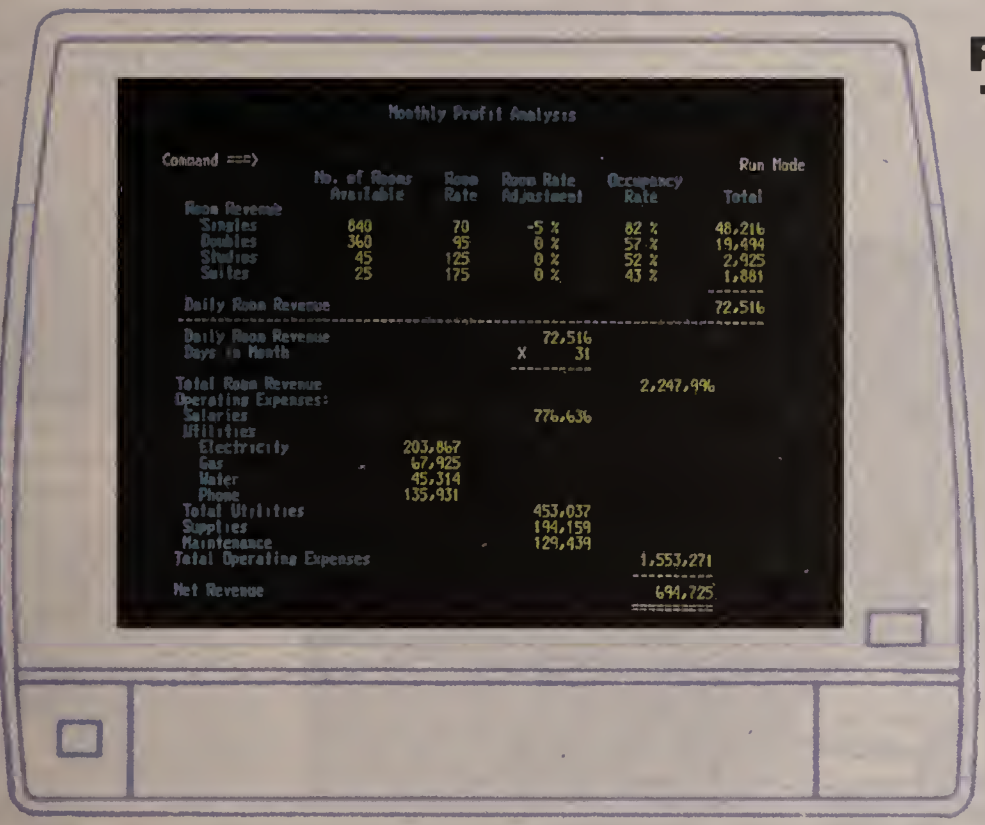




```
AF
Command ===>

                Departmental Reporting System

Place an "X" beside the appropriate options below.

Please indicate how you would like for the data to be processed.

   X Produce Interactive Report    _ Copy Data on Diskette
   _ Print Locally                 _ Upload Data to Corporate File

To process data on the PC, choose a report format.

   X Bar Chart
   _ Banner and Stub Report
   _ Frequency Table

To process data on the host, specify where the analysis results
should be placed.

   _ SAS Data Set          _ Sequential File
     VSAM File             _ Output Window of PC
```

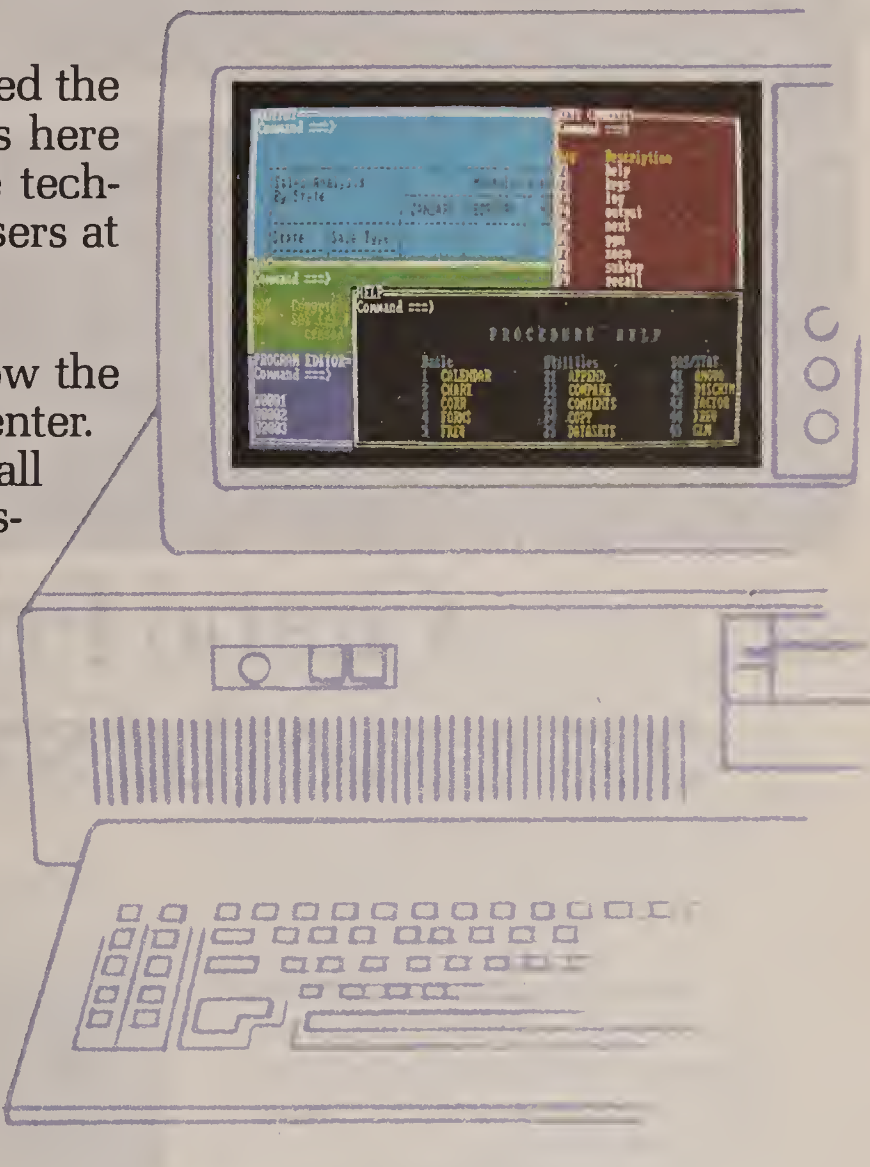
SYSTEM



```
                     Monthly Profit Analysis

Command ===>                                                Run Mode
              No. of Rooms   Room   Room Rate   Occupancy
               Available     Rate   Adjustment    Rate       Total
  Room Revenue
    Singles       840         70       -5 %       82 %      48,216
    Doubles       360         95        0 %       57 %      19,494
    Studios        45        125        0 %       52 %       2,925
    Suites         25        175        0 %       43 %       1,881
                                                           -------
  Daily Room Revenue                                        72,516
 ------------------------------------------------------------------
  Daily Room Revenue                      72,516
  Days in Month                         X     31
                                        ---------
 Total Room Revenue                                 2,247,996
 Operating Expenses:
  Salaries                               776,636
  Utilities
    Electricity          203,867
    Gas                   67,925
    Water                 45,314
    Phone                135,931
  Total Utilities                        453,037
  Supplies                               194,159
  Maintenance                            129,439
 Total Operating Expenses                           1,553,271
                                                    ---------
 Net Revenue                                          694,725
                                                    =========
```

Ready-to-Use Tools for Every Task. The SAS System brings you more than 125 integrated procedures for data analysis and decision support. Statistical analysis and spreadsheets. Quality control and customized graphs. Project management and much more.

And you can put the SAS System to work where you need it most. The language, syntax, and commands are the same for mainframe, mini, and personal computers. So it's easy to move applications between systems, departments, or company locations.



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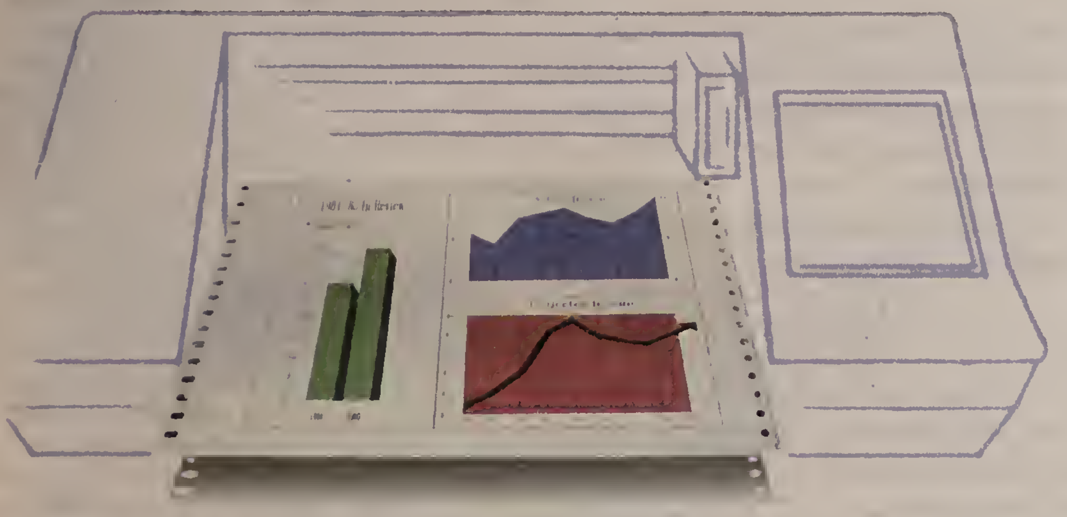

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IBM Credit at crossroads

From page 19

sure that its equipment was sold.

Over the next year, IBM's marketing powers strongly urged those of us in the front lines to sell the IBM Credit lease and to sell it well. Clearly, the company wanted to establish IBM Credit as a major player. The argument made was that leasing customers would be better off dealing with an arm of IBM than with an independent. I heard no compelling financial arguments. The chief pitch seemed to be that if it was IBM, it had to be better.

IBM Credit's rates were high and terms were mostly inflexible. For example, at one time a person could lease CRTs installed locally but not at remote locations. I became one of the few IBM staff members outspoken against IBM Credit, which was not a brilliant career move at Big Blue.

Watching from the outside

Soon I was out of IBM and working for a large, independent lessor/broker. Then, from the outside, I watched IBM Credit suddenly start to become so rate-aggressive on lease packages, including its 4381 processor, that even third-party lessors willing to take a major gamble on the equipment's residual value were unable to approach IBM Credit's rates.

Why was IBM Credit being so aggressive? At first, I speculated that IBM was using IBM Credit's low financing rates to help market the 4381. It sounded logical and was not without precedent: Don't automakers help certain models with their own finance operations? But no; I later heard from customers that IBM Credit was not offering its attractive leasing deals until after the equipment decision had been made. Now I occasionally see IBM Credit push hard-to-sell lease packages in some large deals that do not include a 4381 at all. For whatever reason, IBM wants that leasing business for itself.

Did IBM originally intend its leasing arm to be so aggressive? IBM, I imagine, might say the leasing business has turned out to be more profitable than expected. Less charitable observers might suggest that although we might think IBM would be happy enough to get its equipment in the door, its people, used to winning most of their competitive battles, had their egos bruised by seldom winning lease proposals when they represented IBM Credit. IBM people are not used to losing, so a rationale for winning had to be found.

Whether it will prove wise for IBM in the long run if IBM Credit wins these battles remains to be seen. A leasing company and a parent manufacturing company are, by their very natures, at odds. At the end of a contract, a leasing company wishes the user would pick up his option to buy or keep on leasing until the end of time. The manufacturer wants the user to conclude the lease and acquire a new piece of equipment.

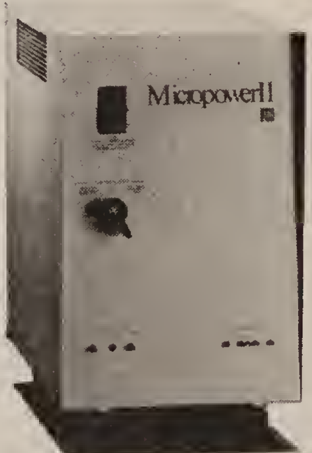
> ❞
>
> ***The chief pitch seemed to be that if it was IBM, it had to be better.***

When IBM Credit wins business at below-market rates, the company or its equity investors in those transactions must realize a significant residual value down the road. If IBM Credit customers extend their leases, IBM Credit, while doing well by itself, will be cannibalizing IBM's new equipment sales. But if the user terminates the lease, hasn't IBM Credit lost what other lessors have learned to be the best bet for optimizing the residual?

In 1982, my IBM manager outlined how the company would be able to book hefty profits on its IBM Credit leases. The problem, of course, is that such accounting talk is based on "what ifs" and "assume thats." Final profits depend on how much the equipment is actually worth at the end of the lease period.

During the next couple of years, many of the original IBM Credit leases reach expiration. IBM may see a world of difference between booking a profit at the inception of a lease and realizing a profit at termination. In other words, "the opera ain't over 'til the fat lady sings."

Grand Prix power comes to the small computer.



Grand Prix racing cars like the one we sponsor as a subsidiary of Emerson Electric Co. demand a steady stream of high-performance power to cross the finish line first.

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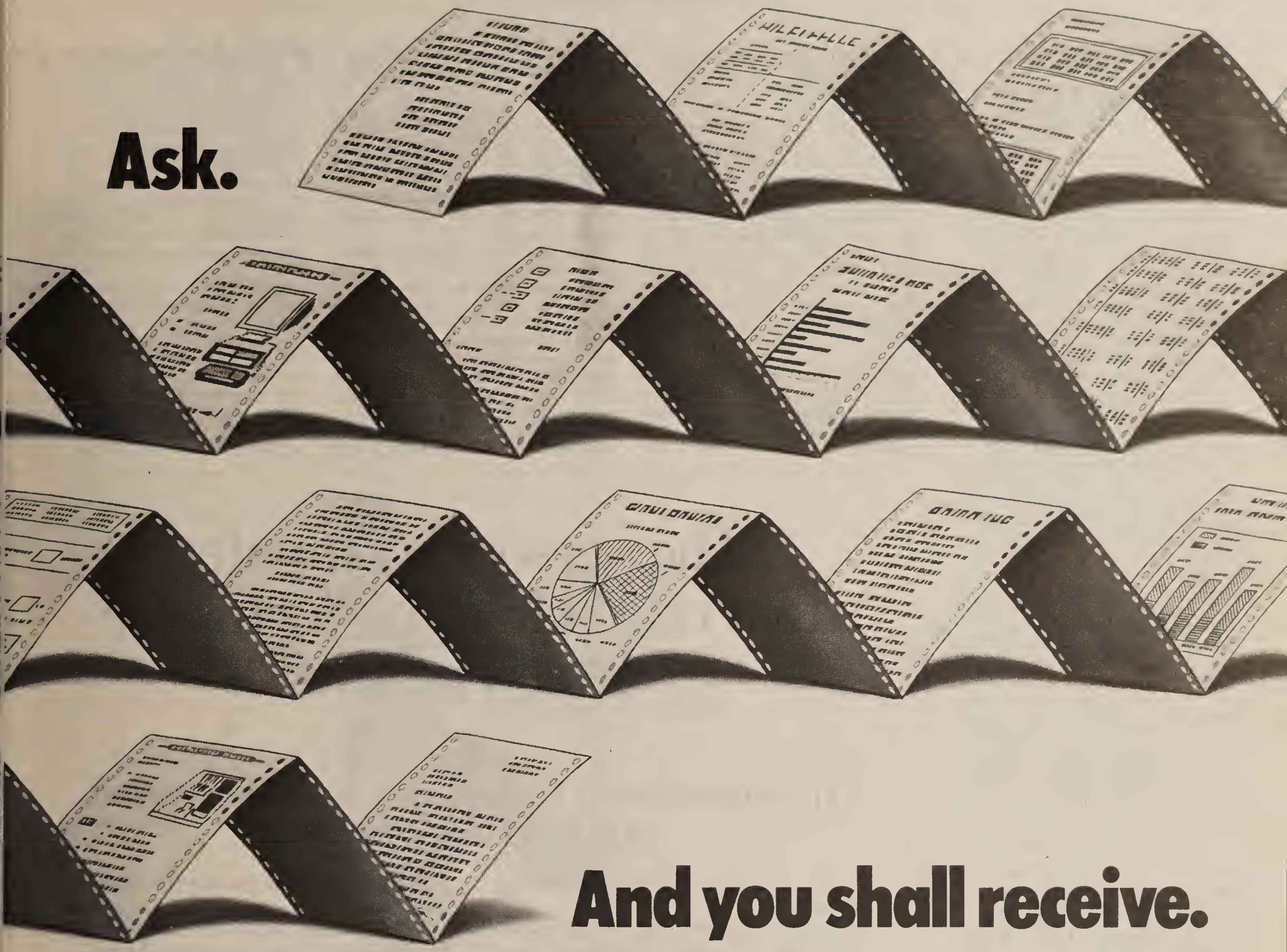

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AT&T's 5300 SERIES TELEPRINTERS

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There isn't just one AT&T 5300 Teleprinter. There are two of them, the 5310 (designed for 9½-inch paper width) and the 5320 (for 15-inch paper width). Both can accommodate up to 6-ply multipart forms.

And though the 5300 Series Teleprinters may stand alone in a physical sense, they interact with nearly every kind of office system.

Without the keyboard, this Teleprinter can be hooked up to displays, the leading PCs and processors through a standard EIA interface.

The 5300 Teleprinters also support popular communications protocols and can talk with systems supporting well-known names, such as DEC* and TI.

Not surprisingly, the Teleprinter interacts with other AT&T integrated products like System 85 and System 75, with Station Message Detail Recording, and our 3B line of computers. For more information, call your AT&T Information Systems Account Executive, authorized AT&T supplier, or call 1 800 247-1212.

What more could you ask for?

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The right choice.

Fiscal woes smother HEP-1

From page 19

Founded in 1968, Denelcor began as a maker of analog computers but switched to development of the digital parallel machine in 1974. Denelcor's European and U.S. investors, who pumped an estimated $50 million of capital into the firm, saw its over-the-counter stock reach 21¾ in 1981 and fall to 1/16th by 1985.

In December, the U.S. Bankruptcy Court in Denver ordered Denelcor to liquidate under Chapter 7 of the Federal Bankruptcy Code, but in January the firm converted to Chapter 11 proceedings in an effort to reorganize the company, the attorney said.

Meanwhile, eight former Denelcor officials are fighting an investor's lawsuit filed in federal court by shareholder Malcolm H. Dubin of Cincinnati, who alleged securities law violations, legal sources said.

David Hirsch, Denelcor's executive vice-president and only remaining employee, did not return several telephone calls seeking comment. Attempts to reach several former Denelcor officials also were unsuccessful.

Hirsch joined the firm as a director on Dec. 6, shortly before the bankruptcy proceedings and the resignation of all the other Denelcor officials, and said he plans to "make a try at reorganization," according to attorney Scheid. "Whether it can be reorganized or not would be rank speculation," he added.

Hayes of Los Alamos, who had once considered forming a Denelcor users group, said the consensus among users was that Denelcor's HEP-1 "had a lot of failings and wasn't fast enough for production work, but it was one of the few parallel processing machines you could actually put applications on."

She praised the architecture of the HEP-1 as a valuable research tool but said Los Alamos let its lease expire Feb. 1. "We couldn't justify spending more money without a follow-on product, HEP-2," she explained.

Denelcor was trying to develop the HEP-2, which was supposed to attain a maximum speed of 4 billion floating-point operations per second and be competitive with Cray and Control Data Corp. machines, but was unable to get the cash infusion needed to produce it.

Although Denelcor once claimed it had shipped 13 HEP-1 units, industry sources could account for only a few customers, namely, Los Alamos and the Argonne National Laboratory located near Chicago (both of which do extensive work for the U.S. Department of Energy); the Army's ballistics lab; the National Security Agency at Ft. Meade, Md.; and two overseas customers.

Also, the University of Georgia in Athens tested the HEP-1 for about a year but returned it to Denelcor, according to Walter McRae, associate director of the university's Advanced Computational Methods Center. "It was a machine that could not compete in the supercomputer market on performance features," McRae said, citing the unit's slow speed.

But McRae said the basic architecture was ingenious. He said it used two mechanisms for communications between processors — a high-speed data switch and multiported global memory for shared variables — rather than the high-speed bus used in other so-called parallel processors.

Paul Messina, director of the Mathematics and Computer Science Division at Argonne, said the lab had an HEP-1 for two years but returned it to Denelcor because of the slow hardware and faulty operating system.

National Security Agency officials declined to comment on their HEP-1.

Industry sources said the HEP-1 was priced at $1.5 million to $2 million, but all of the HEP-1 units shipped to U.S. customers were either leased or provided under a research agreement, not purchased. Apparently, none of them is operating now.

Notes: Cipher supports RT PC

From page 19

las has recently shipped six of its **Flex/32** systems to the tune of $1.35 million. One system, a four-processor model, went to the **Georgia Institute of Technology** where it will perform automobile crash dynamics research in collaboration with a **General Motors Corp. Research Laboratory**. That system will also investigate the dynamic behavior of energy systems and of large structures in space, such as space stations.

■

The ¼-in. cartridge tape drive used in the **IBM RT Personal Computer** introduced last month is being supplied by **Cipher Data Products, Inc.** The 55M-byte, stand-alone tape subsystem is based on Cipher's **Model 540** and uses a modified **QIC-02** interface and a proprietary recording format.

■

California Institute of Technology (Caltech) and **Ametek, Inc.**'s **Computer Research Division** of **Arcadia, Calif.**, have agreed to produce and market a commercial version of the **Mark III Hypercube** concurrent processor. Mark III is a result of studies at Caltech's **Jet Propulsion Laboratory**. The computer is expected to employ up to 256 nodes that use **Motorola, Inc. 68020** 32-bit microprocessors. It will be marketed as the Ametek **System 25** and will be compatible with Ametek's **System 14** line of concurrent processors, which are now in production.

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If you work with high volumes of information, you need answers fast.

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Which is why IBM created the Personal Computer AT® system. It's changed a lot of ideas about business computing.

The idea of "fast" has become much faster. The idea of "data capacity" has become far greater.

There are new definitions of "power" in a stand-alone PC. While phrases like "sharing files" and "multi-user systems" are being heard more often.

And surprisingly, words like "affordable" and "state-of-the-art" are being used *together.*

Clearly, the Personal Computer AT is different from anything that came before. And what sets it apart can be neatly summed up in two words.

Advanced Technology.

If you've ever used a personal computer before, you'll notice the advances right away.

To begin with, the Personal Computer AT is extraordinarily fast. That's something you'll appreciate every time you recalculate a spreadsheet. Or search through a data base.

It can store mountains of information—literally thousands of pages' worth—with a single "hard file" (fixed disk). And now you can customize your system to store up to 30,000 pages with the addition of a *second* hard file.

The Personal Computer AT runs many of the thousands of programs written for the IBM PC family. Like IBM's TopView, the program that lets you run and "window" several other programs at once.

Perhaps best of all, it works well with both the IBM PC and PC/XT. Which is welcome news if you've already made an investment in computers.

You can connect a Personal Computer AT to the IBM PC Network, to share files, printers and other peripherals with other IBM PCs.

You can also use a Personal Computer AT as the centerpiece of a three-user system, with your existing IBM PCs as workstations.

Most important, only the Personal Computer AT offers these capabilities *and* IBM's commitment to quality, service and support. (A combination that can't be cloned.)

If you'd like to learn more about the IBM Personal Computer AT, see your Authorized IBM PC Dealer, IBM Product Center or IBM marketing representative. For a store near you, call 1-800-447-4700 (in Alaska, call 1-800-447-0890).

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System/36 PC offers blend of quirkiness and reliability

Users, resellers react to recent enhancements

By James A. Martin

IBM's announcement last month of enhanced memory and multiuser capabilities for the System/36 PC was seen by resellers and current System/36 PC users as a move in the right direction, but questions remain regarding the machine's effectiveness.

Some value-added resellers and authorized dealers — who represent two primary distribution channels for the 7-month-old product — complain that the System/36 PC is a poor seller. The major complaints of those interviewed recently by *Computerworld* center on the slim catalog of third-party software available and the amount of hardware required for the system. In addition, users are faced with restrictions in running micro software programs on the required IBM Personal Computer attached to the System/36 PC.

But for many small businesses, operating without corporate MIS departments, there is comfort in the IBM name. In addition, the System/36 PC's limitations are not always seen as problems by small operations.

"Our company has a policy to stay with IBM equipment," said William J. Vallie, director of data processing for Little Caesar Enterprises, Inc., a Farmington Hills, Mich.-based pizza franchisor. "We have been very satisfied with IBM as far as reliability and service and see no need to change."

The pizza franchisor operates a System/36 in its headquarters, with one System/36 PC in each of its division offices in Chicago, Indianapolis and Orlando, Fla. The company headquarters upgraded to a System/36 from a System/34 three years ago and viewed the System/36 PC as a logical extension.

"We went with the System/36 PC because we were able to take existing System/36 programs and copy them over," Vallie said. "These programs had already been tested and debugged, so it saved us a lot of headaches."

The only disadvantage to the System/36 PC, Vallie said, was the incompatability of the 8-in. disk drive in the System/36 with the 5¼-in. disk drive in the System/36 PC. "When you're trying to transfer programs and files, you have to go through a communications program where it would be easier just to make a copy of a diskette and load it from one to the other." Vallie said file transfer is accomplished using 4.8K bit/sec. modems with bisynchronous capabilities.

Although there are diskette exchange facilities available from IBM and third-party vendors, Vallie said, file transfer "has not been that big of a problem to warrant that investment." But, he added, "It would be nice if IBM made a System/36 PC with 8-in. drives or a System/36 with 5¼-in. drives."

Jacore Systems of Charleston, S.C., a reseller of IBM equipment, chose the System/36 PC for its data processing and software development because it was made by IBM and is compatible with its existing System/36 Model 5362, or the Baby/36. According to Fred Corson, president of Jacore Systems, IBM has "a good track record, and this looked like a good decision for a multiuser computer."

> ***'We went with the System/36 PC because we were able to take existing System/36 programs and copy them over.'***
>
> **— William J. Vallie, director of data processing for Little Caesar Enterprises, Inc.**

Corson said he has had a few problems with the System/36 PC, one being the restricted number of terminals supported, but he added that IBM's announcement that the System/36 PC can now support up to six terminals should solve the problem. "The System/36 PC only needs to support up to about six terminals. If you need to go beyond that, then you're probably going to need a bigger machine anyway."

This desktop version of the System/36 was introduced in June 1985, two years after the System/36 line was introduced as an upgrade to the System/34. The System/36 PC was unveiled with a standard configuration of 256K bytes of internal memory that supported up to four workstations, at least one of which is required to be an IBM Personal Computer. Memory was increased to 1M byte last month. Also known as the 5364, it runs existing System/36 application programs without recompilation.

Some 1,500 System/36 PCs were sold worldwide in 1985, with about 1,350 of those going to users in the U.S., according to an estimate by International Data Corp. (IDC) of Framingham, Mass.

IBM spent most of 1985 lining up

See **IBM** page 28

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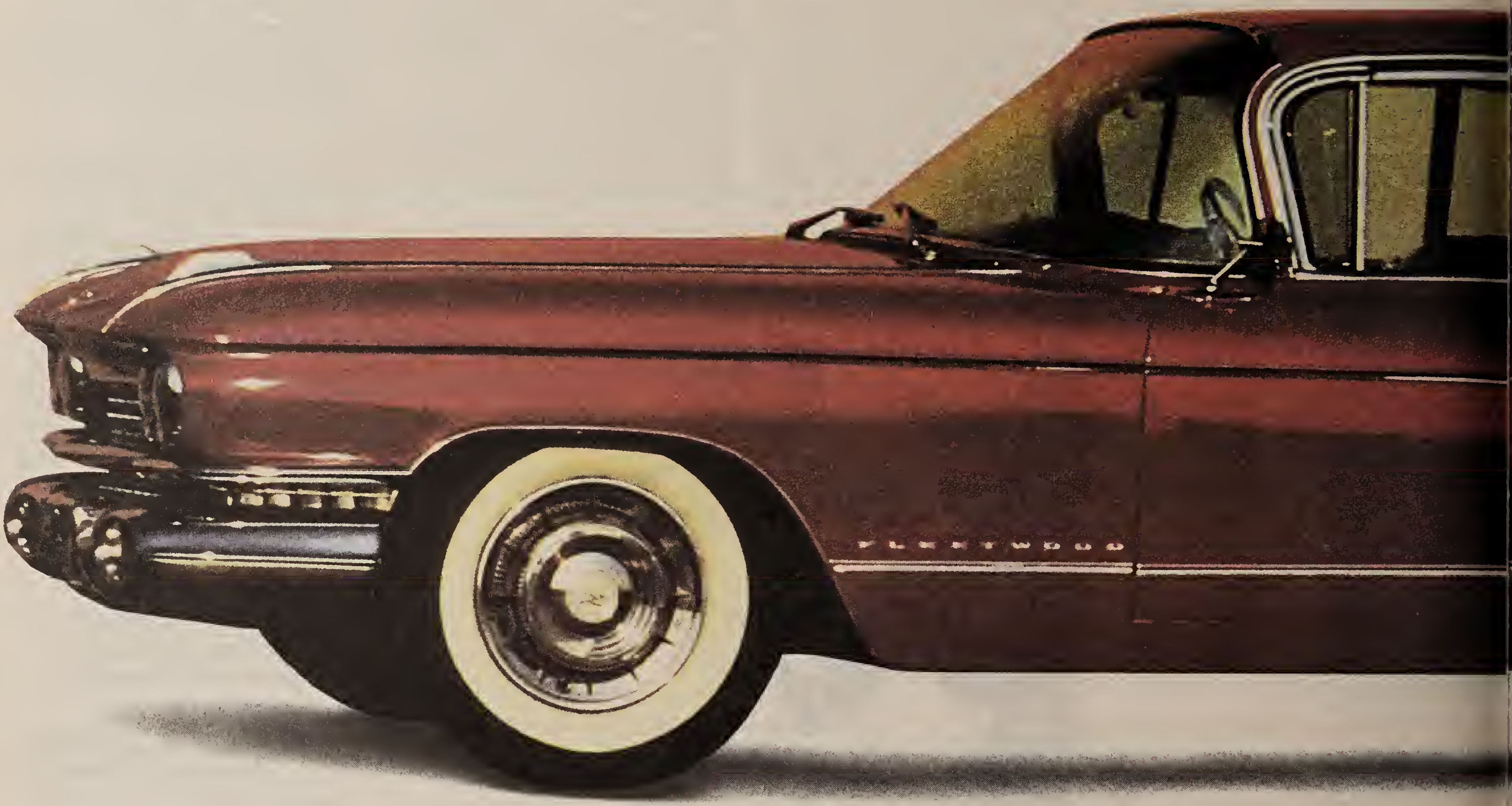
It's a lot like a Bernoulli Box:



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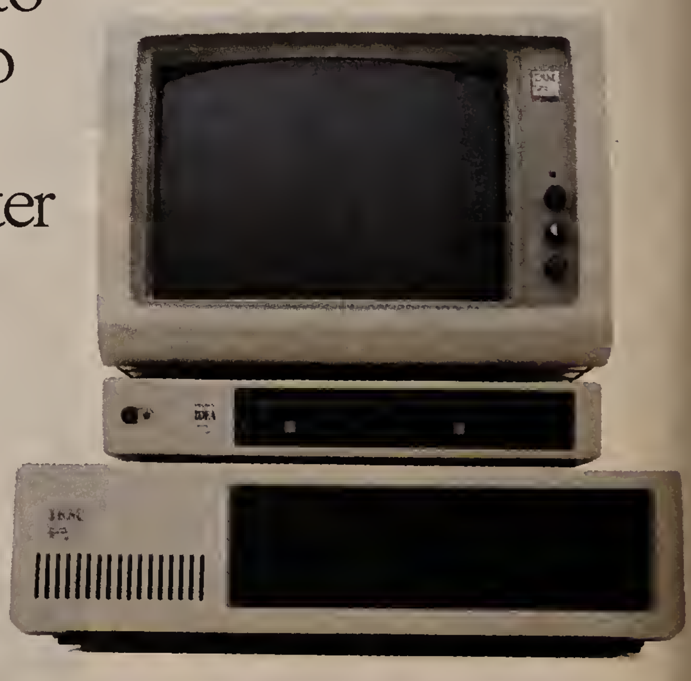
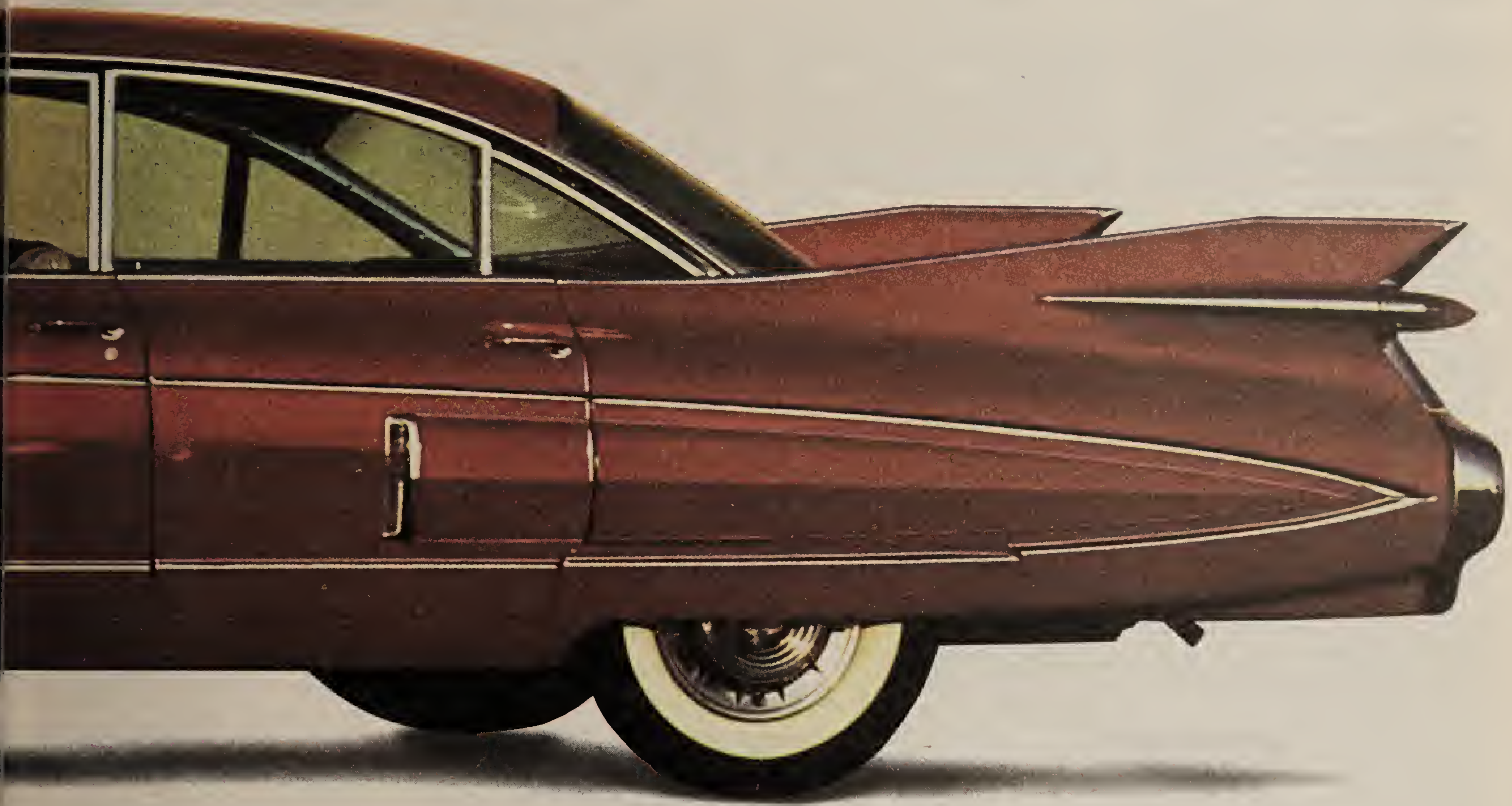
Diskit 2, with twin 10MB removable Winchester cartridges, is twice as fast as Bernoulli when compared in self-booting modes. Using both read and write functions in copying data from drive to drive, Diskit 2 outperformed Bernoulli by a factor of two.

Diskit 2 is easy to install. You just plug it in, type "INSTALL" and you're up and running.



Nice to drive, but tough to park.



(That's about the same time it would take to scan the first paragraph of the Bernoulli manual.)

The Diskit 2 cartridge drives are based on the latest in Winchester technology and offer virtually unlimited capacity for storage-intensive applications. And since the cartridges are pocket-size, 5¼," they are easily removable for the utmost in data security.

We torture-test every Diskit 2 before it's shipped—both piece by piece and as a complete subsystem. That means we can offer a full-year limited warranty, instead of Bernoulli's 90 days. And if you have any questions, IDEA's toll-free technical support is there to help.

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Inherent limitations, lack of software plague System/36 PC

By James A. Martin

"We looked at the System/36 PC and then decided not to sell it."

That comment by Hal Prewitt, president of Core International, a value-added reseller based in Boca Raton, Fla., was typical of criticisms of the IBM System/36 PC aired by value-added resellers, retailers and analysts recently.

> ***'We didn't like the way the System/36 PC was organized and designed, with inherent limitations built into the system. . . . I don't feel it's a simple or commonsense way to perform an operation.'***
>
> — Hal Prewitt, president of Core International

"We didn't like the way it was organized and designed, with inherent limitations built into the system such as the number of terminals it supports and the fact that you also have to buy a PC rather than just using a terminal emulation board that turns the PC into a System/36 terminal. I don't feel it's a simple or commonsense way to perform an operation," Prewitt said.

Prewitt added that the System/36 PC is "slow and expensive, and you can get equal or better results by investing in software that emulates the System/34 or System/36 code on a PC or compatible."

The System/36 PC has been a poor seller because "there is practically no software available for it," according to James H. Wells, president of Microage Computers in Beaumont, Texas. "We haven't promoted it, and we don't have any salesmen on the road for it because there just isn't the software complement."

Wells said his dealership has sold twice as many Altos Computer Systems 986 series of multiuser microcomputers as it has System/36 PCs for that reason. The recent enhancements will help sell the System/36 PC because software developers should now find it more enticing, he added.

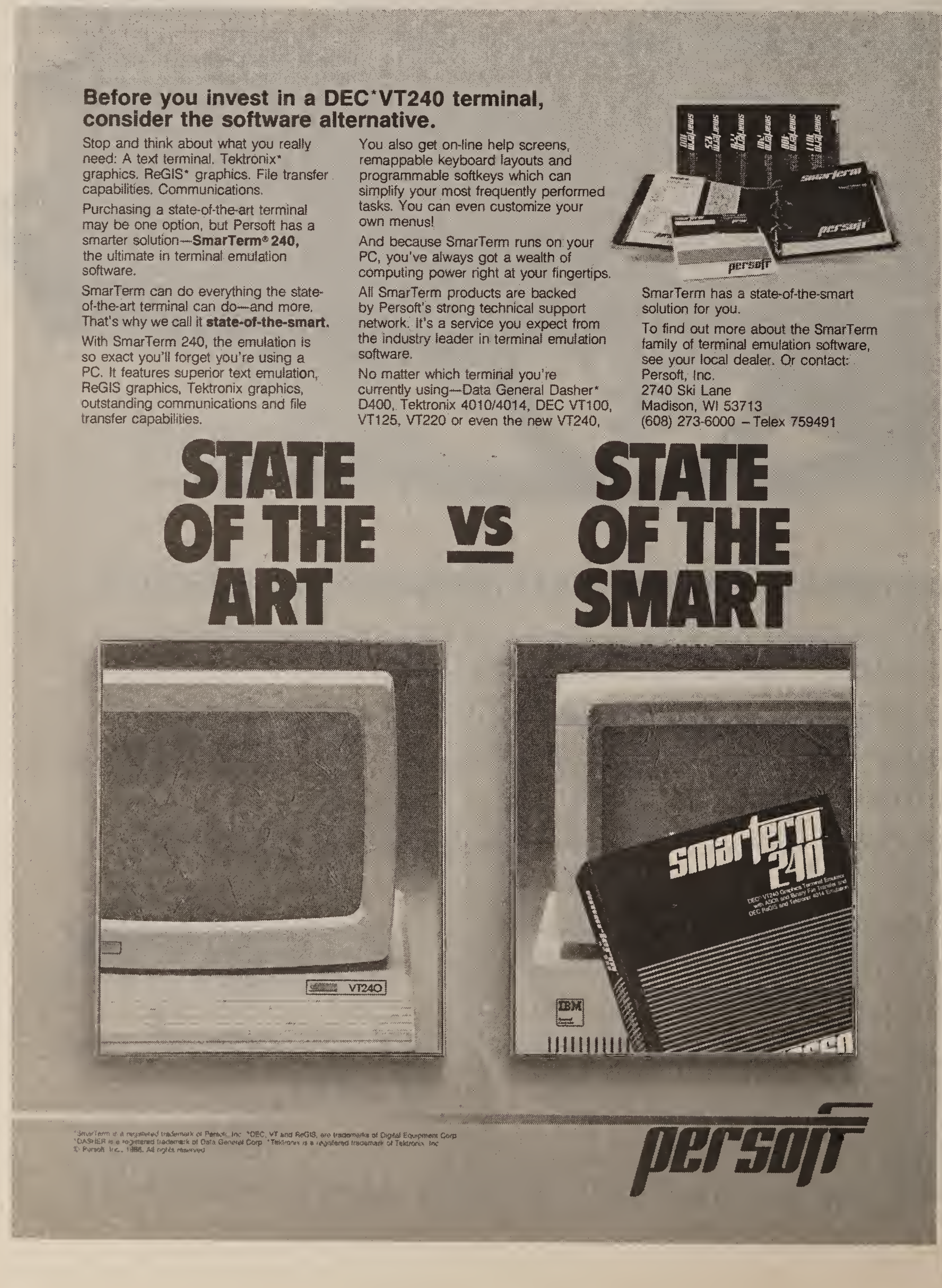
Small businesses might be attracted by the standard system configuration price, $6,795 for the new version, and the confidence of going with Big Blue. But potential customers should be aware of the System/36 PC's limitations before investing, according to Gwen Peterson, director of business computer services for Dataquest, Inc., a market research firm in San Jose, Calif.

For example, IBM said at the time of the System/36 PC's introduction that its Topview and Business Management Series software, Microsoft Corp.'s Multiplan, Borland International's Sidekick and Microstuf, Inc.'s Crosstalk XVI should not be loaded while the System/36 PC is active. Other problems occurred with Lotus Development Corp.'s Symphony and some IBM PC-DOS 3.1 functions. Also, the IBM PC Network is not supported.

"I was rather disappointed in the System/36 PC because of the number of limitations, particularly in terms of concurrent modes of the PC and the System/36 PC. You really have to be aware of what is allowable and what is not, as far as what software could be supported. You have to make sure that you have a very specific configuration you can use," Peterson said. "Fortunately, IBM has been very straightforward in describing its limitations."

IBM's System/36 PC enhancements are a vital step in making what is essentially a good idea a better one. "There are small business solutions other than the System/36 PC," Peterson said, "but not many that small businesses are able to afford."

By bringing down the price and scale of the System/36, small businesses can afford a machine that allows them to grow into larger systems with ease, which works to the advantage of both IBM and the small business, Peterson added.



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persoft

IBM desktop elicits reactions

From page 25

distribution channels for the system and has recently increased its advertising, which, coupled with the machine's January enhancements, should result in stronger 1986 sales, IDC said.

Among other enhancements announced last month were an upgraded version of IBM's SSP, the System/36 PC operating system, and stronger communications capabilities.

But despite confidence that it provides a growth path for small businesses, the System/36 PC is viewed by some as a quirky machine that is not likely to ignite great interest in the end-user community.

COMMUNICATIONS

DATA STREAM
Elisabeth Horwitt
CW Senior Editor

Brighter skies for satellites

At this year's Communication Networks '86 Conference, a disgruntled attendee — whether vendor, user or speaker is not known — was overheard saying, "We mentioned satellite networks, and they started laughing."

While telecommunications carriers have made thrifty use of satellite bandwidth, the private satellite network market has been something of an industry laughingstock, though no source of mirth to the companies trying vainly to sell equipment to wary businesses.

At a conference seminar, Jim Keough, manager of telecommunications quality assurance at General Electric Information Services Co. (Geisco), in Rockville, Md., related to a receptive audience some of the pitfalls and pratfalls that have discouraged many businesses from installing private satellite-based communications networks.

Keough started off with the "common objections" that often come up when a company considers satellite networks for the first time: antenna vulnerability to weather and to the sun's position; and data security ("protect your site with fences and surveillance, unless your company is universally loved"). Another potential problem is propagation delay — the dead space on the phone you hear while your signal travels by satellite — which all but preclude bisynchronous communications on a satellite-based data network and which consistently annoyed users of Geisco's satellite-based voice network.

Keough then used his own experiences to illustrate how human factors can bog down a private satellite network installation. His company spent a

See **BRIGHTER** page 31

Debuts target link markets

Ungermann-Bass, Sytek, Network Systems nets out

By Elisabeth Horwitt

During the week of the Communication Networks '86 Conference, major products were announced by Ungermann-Bass, Inc., Sytek, Inc. and Network Systems Corp.

According to Terence Bentley, senior analyst at Boston research company the Yankee Group, all three announcements are good news to customers because they significantly extend each vendor's ability to serve its chosen market niches. The three companies all offer networks that act as conduits for asynchronous and synchronous terminal-to-host connections but to very different kinds of users.

Network Systems has long dominated the high end of the market with Hyperchannel Series A, a 50M bit/sec. network. "We go after the biggest users, programmers, engineers and others for whom high-speed data transfer is a top priority," said Network Systems Director of Systems Architecture Dennis Schibonski. Hyperchannel A's Network Executive communications software provides high-speed bulk file transfer and peripheral sharing among mainframe hosts from a wide range of vendors, including Sperry Corp., Perkin-Elmer Corp., IBM, Digital Equipment Corp. and Control Data Corp.

The network also links minicomputers and engineering and computer-aided design and manufacturing workstations from Sun Microsystems, Inc., Apollo Computer, Inc., Hewlett-Packard Co. and DEC.

Engineers, software programmers and other technical professionals can exchange software, documents and complex diagrams at high speeds as well as access files, programs and peripherals residing on the mainframe hosts. However, it costs between $38,000 and $50,000 to hook up a computer to Hyperchannel Series A. The price appears negligible for a million-dollar mainframe but not for a $20,000 supermicrocomputer.

Hyperchannel Series B, Network Systems' new offering, is a more cost-effective way for workstations to access Network Executive services and Hyperchannel A resources. A series of adapters link IBM and CDC mainframes, supermicros and the

See **DEBUTS** page 30

U.S. government seeks contractor for $4 billion long-distance service

By Bryan Wilkins

WASHINGTON, D.C. — The federal government is offering Fortune 100 companies a lesson by example on how to shop for a long-distance network in the post-divestiture telecommunications market. The General Services Administration (GSA) is planning the largest telecommunications service procurement on record: the Federal Telecommunications System (FTS) 2000, a $4 billion state-of-the-art long-distance network.

Slated to be up and running by 1990, the network will handle the government's voice, data, graphics, facsimile and videoconferencing needs until the end of the century. The old, largely analog, FTS no longer can handle the government's communications needs, according to Bernard Bennington, GSA deputy commissioner of telecommunications services.

The GSA will act as wholesale buying agent, reselling communications and services to government agencies and departments. While some organizations may choose to purchase and install their own networks, some major telecommunications users have already signed on, including the Department of Health and Human Services and the Department of Agriculture. Once signed on, the department or agency is committed to a three-year use of FTS.

Bennington expects the FTS 2000 project to be a trendsetter for businesses that are planning similar installations. "We are

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NEW THIS WEEK

- Digital Communications Associates expands its Series 300 network product line
- For more on this and other new products, see pp. 99-128.

INSTANT ANALYSIS

"There are a few attractive simultaneous voice and data applications, like CAD/CAM users changing a design while they talk; but there is very little user interest in pure digitized voice."

— James Huskinsin, district staff manager, product development, U.S. West, at a seminar on ISDN

Tymstar packet switching satellite facility now available

Customers can buy public, private lines

By Elisabeth Horwitt

WASHINGTON, D.C. — At the Communication Networks '86 Conference held recently, Tymnet/McDonnell Douglas Network Systems Co. announced the availability of the Tymstar digital satellite service, a public network offering that integrates satellite facilities with Tymnet's value-added packet-switched network.

Tymnet has bought transponder space from GTE Corp. and is reselling the bandwidth to customers on a permanent, on-demand and time-specific basis (for example, a user could have a permanent time slot between, say, 7 p.m. and midnight). The vendor also sells and leases very small aperture terminals that can transmit on the Ku-band bandwidth (see story above).

Tymstar customers can set up private satellite networks by leasing or buying very small aperture terminals and transponder bandwidth, or they can use Tymstar's network facilities in combination with Tymnet's packet-switched network on an as-needed basis. Tymstar's very small aperture terminals are equipped with packet-switched engines that enable users to transmit data over the satellite link in packet form, often a more cost-efficient way of using bandwidth. The engines also run software that takes care of protocol conversion between incompatible systems.

Tymnet has set up gateways between Tymstar satellite facilities and its own packet-switched nodes. Users can thus access the vendor's packet-switched services through very small aperture terminals. According to Tymstar product marketing manager Mark McWilliams, this offers advantages. First, users have access to two different types of transmission. "Financial managers in a large corporation might do most of their communicating on the satellite network; but it is more cost-effective to access, say, Source Telecomputing Corp.'s The Source over Tymnet. They can do both through the very small aperture terminal." Second, since satellite links are distance independent, companies located some distance from the nearest Telenet packet switching node can save money by accessing the service through a small aperture terminal, as opposed to either a leased-line or dial-up connection.

Tymstar offerings are in beta test right now at several sites, including oil services firm Western Company of North America and credit card processing firm First Data Resources. Commercial availability is scheduled for March 1.

Tymstar's closest competitor is Skystar Data Service, offered jointly by GTE Corp. subsidiaries GTE Telenet Communications Corp. and and GTE Spacenet Corp.. Skystar is commercially available at this time, but no customers are formally signed up yet. Several companies are in the fi-

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Debuts target link markets

From page 29

IBM Personal Computer family to a 10M bit/sec. network at a cost of between $9,000 and $20,000 per node. Workstations can use Network Executive to exchange data and programs with one another or with hosts on Hyperchannel Series A or B. Series A and B networks communicate via the company's BC715 link adapter, priced at $20,000.

Series B is based on Hyperbus, an existing Network Systems network designed to provide an efficient connection between multiple asynchronous and synchronous terminals and mainframe hosts on Hyperchannel A.

"Network Systems hoped Hyperbus would compete with the Syteks and Ungermann-Basses of the world; then they realized just how competitive that market is," Bentley said. Hyperbus currently only accounts for 13% of the vendor's revenue, he added.

Bentley called Series B a marketing ploy to leverage Hyperchannel A's strong customer base to sell a lower end network and also to take some business away from third-party vendors that have linked their own 10M bit/sec. networks to Hyperchannel A.

Series B's one limitation is an optimal throughput speed of 2M bit/sec. Schibonski claimed that this is adequate for a network of intelligent workstations; the problem is that, unlike Series A, which uses a token-passing protocol, Series B uses carrier-sense multiple access with collision avoidance (CSMA/CA), which is vulnerable to degradation during peak traffic periods.

Sytek terminal network

Sytek's announcement solidifies an already strong position in the market niche that Network Systems tried to invade with Hyperbus. Sytek is, in fact, one of the vendors that has linked its terminal nets to Hyperchannel A's host backbone.

Sytek's main product line, Localnet 20, is a broadband network supporting up to 20 120K bit/sec. channels. It was designed to support low-speed — up to 19.2K bit/sec. — terminal-to-host communications.

Sytek's new product, System 2000, is a more powerful version of Localnet 20 that supports up to 60 120K bit/sec. channels. Sytek also has introduced "distributed network management," an important feature for customers, according to product manager Bruce Davis. "We have installed 14 or 15 networks with over 2,000 nodes, three or four networks with 5,000 nodes. When networks get that large, management is critical."

System 2000 enables network managers to predefine several alternative channels and ports that any given terminal can use to establish a session with a given host. Intelligent network boards automatically try the next possible route if one is busy.

The Sytek 2522 asynchronous interface card costs $600; the 2532 Modular Packet Communication Unit, which links hosts to the network, costs $4,400. Packet Communication Units, which handle network management, cost $1,195 each.

Ungermann-Bass connection

Ungermann-Bass' latest announcement, the 3270 Personal Connection, extends the capabilities of the vendor's personal computer-to-host networking products. The vendor's central product offering, the Network Interface Unit, interfaces IBM Personal Computers and asynchronous hosts from Data General Corp., DEC and HP on a CSMA/CA or token-ring network implemented on broadband, baseband or fiber-optic media. Last summer, Ungermann-Bass introduced the Network Interface Unit 74 and 78, which provide IBM host links for 3270 terminals and Personal Computers.

> ”
>
> ***'There are clear signs of approaching saturation in the 10M bit/sec. vendor-independent networking mart.'***
>
> — Terence Bentley
> Yankee Group

The 3270 Personal Connection software enables an IBM Personal Computer to emulate a 3270 terminal without needing a special board such as Irma from Digital Communications Associates, Inc. Model I — the basic package — costs $95 and allows an IBM Personal Computer user to "hot-key" between a Personal Computer session and a host session.

Model II, at $595, provides a multisession windowing capability similar to that of the 3270-PC. The user can simultaneously view one Personal Computer session and up to four applications on DEC or IBM hosts or up to five connections on printers or file servers running Microsoft Corp.'s MSNet. The package also supports IBM's Application Program Interface and host file transfer in the TSO or CICS environments.

"Ungermann-Bass offers a good, value-added solution for the medium-range, PC networking market," summed up Bentley of the Yankee Group. He added that with their new offerings, all three vendors have significantly improved their chances of surviving an industry shakeout, which should occur, he predicted, within the next six months. "There are clear signs of approaching saturation in the 10M bit/sec. vendor-independent networking market. There are bound to be casualties."

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COMMUNICATIONS

U.S. government buys, builds net

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definitely getting lots of interest from large telecommunications users in the private sector," he said. One group that wants to observe the GSA experiment is the International Communications Association (ICA), a users group of corporations with annual telecommunications budgets exceeding $1 million. The GSA is an ICA member.

According to Bennington, members of the private sector hope to benefit from observing the GSA's attempt to cope with a multitude of carriers and to install network management and maintenance systems without interrupting the delivery of reliable services during the transition. Many also view the government's procurement as a prototype for integrated services digital networks, which they hope to install eventually.

Much of that interest, however, is focused on how the government chooses and deals with vendors. Right now, the GSA is looking for a prime service contractor that will assume overall responsibility for installing, managing and maintaining FTS 2000. MCI Communications Corp., AT&T Communications and GTE Corp., the three largest vendors that could meet the performance requirements for the network, have already commented on the draft specifications and will issue final proposals this summer, Bennington said. Installation should begin sometime in 1987.

Choosing one carrier to be prime contractor could be construed as going against the Federal Communications Commission's stated policy of discouraging any one vendor from achieving a too-dominant position in the telecommunications market. But Bennington claimed that the GSA does not expect one carrier to provide all of the voice and data circuits for FTS 2000.

At the same time, GSA benefits from having just one vendor to turn to when problems arise or when changes need to be made. This should avoid finger-pointing problems so common in multivendor telecommunications installations. Bennington said the GSA expects dealings with its vendors to be "very, very manageable."

The Office of Management and Budget, which oversees the expenditures, retains some doubts, however, as to whether the GSA's strategy is the most cost-effective way to deliver network services. A compromise agreement between the two agencies requires that the GSA conduct a rigorous quantitative analysis of the most promising alternative strategies. The GSA is requiring the successful FTS 2000 bidder to compute and compare the total cost to the government of various alternative strategies to replace the existing system. An independent panel of outside experts in telecommunications and government will then make a recommendation.

"The quality of the integrated service provided by FTS 2000, when it is up and running, will determine if the single, prime contractor approach is successful or an expensive mistake," Bennington said.

Brighter skies for satellites

From page 29

great deal of time and money, for example, convincing a recalcitrant Tampa, Fla., landlord that a C-band satellite dish bought from Vitalink Communications Corp. would not irrevocably harm his landscaping. Keough flew down to Tampa with an artist's rendering of how Geisco proposed to minimize the dish's impact on the scenery. "We sold him with a picture of the dish, five feet lower than the initial plan and screened by shrubbery," Keough reported. Unfortunately, Geisco discovered that the new plan required radical changes to the dish, which would mean costly delays to the project.

Keough's group got around this problem by lowering the dish into a 5-ft-deep pit. "But when the pit was dug, we discovered that the water table is only 2 feet down. So we got into the swimming pool business," Keough explained. Housed in a concrete-lined pit 5 feet deep, the dish was finally acceptable.

To the landlord, that is. Geisco still had to get approval from the Federal Communications Commission and from business neighbors and carriers in Tampa whose microwave signals might be subject to interference from the service company's satellite transmissions and vice versa. According to Keough, the cost of installing the satellite dish, including hassles with the landlord, neighbors and regulatory agencies, was $50,000 greater than the $100,000-plus cost of the equipment.

Keough's story illustrates most of the reasons why the private satellite-based communications network market never quite took off during the early 1980s. The expense and hassle of installing the technology put it out of reach of all but a few Fortune 100 corporations, such as financial and service companies with a few sites that exchange large volumes of data on a regular basis. Citibank N.A., for example, has set up large earth dishes, costing $1 million or more, to handle multiple communications channels between sites in 10 major cities.

But the bulk of U.S. businesses have held back. According to a September 1985 report from New York research firm Frost & Sullivan, Inc., 1981 total revenue for U.S. vendors

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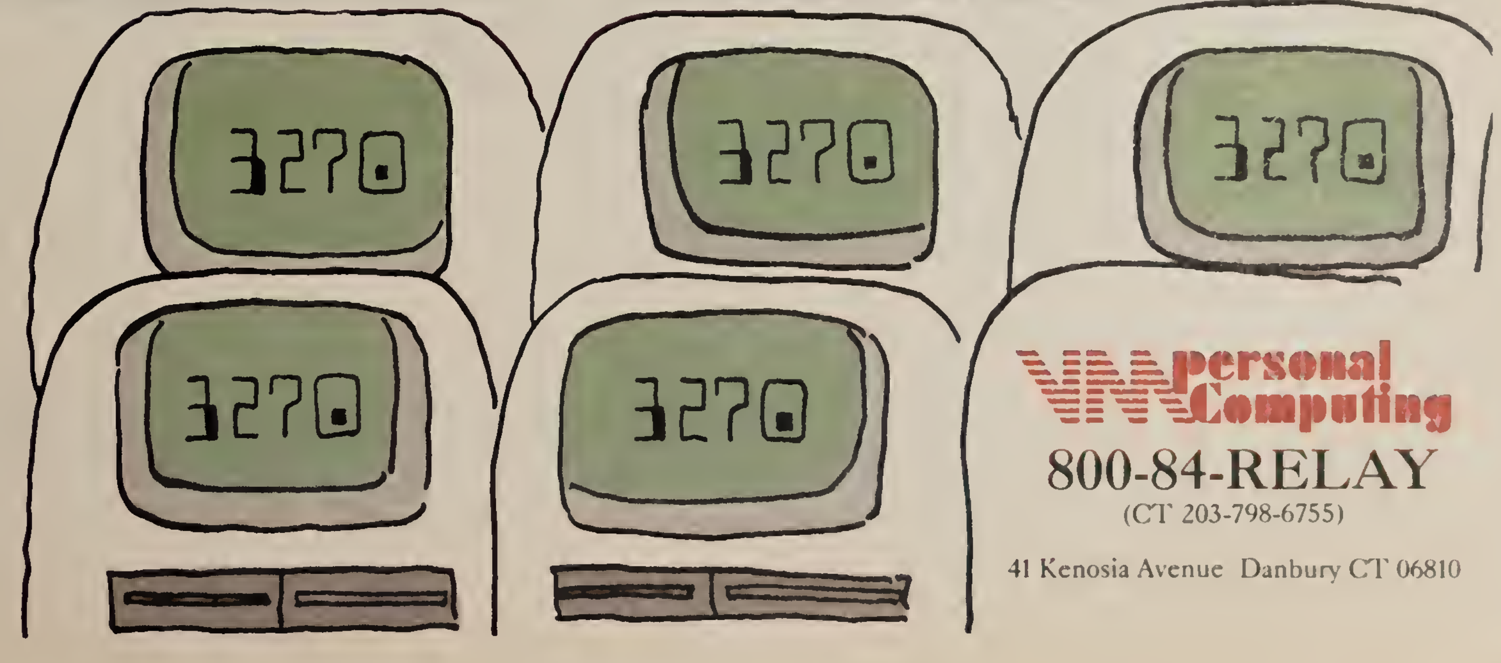

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Brighter skies for satellites

From page 31

of private satellite network terminal equipment was $48.9 million. By 1984, that figure had gone up to $230 million, but the total was divided among 22 vendors, and the pickings remained lean.

Frost & Sullivan forecasts brighter skies for the satellite industry during the next decade, however. The 1985 revenue figure for the private satellite network (earth station equipment and transponder bandwidth combined) was $844 million. Predicted revenue for 1990 is $2.73 billion and for 1995, $8.36 billion.

The new outlook stems from two related trends. First of all, more companies in more industries are beginning to make efficient, cost-effective data communications systems a strategic priority. Second, the advent of very small aperture terminals that handle Ku-band transmissions has put satellite networking within reach of many companies whose communications needs did not cost-justify C-band earth stations.

One major advantage of the Ku-band is that, unlike the C-band, its high frequency prevents it from interfering with ground-level microwave transmissions. This does away with the need for businesses to haggle with the FCC and for local carriers to fight for the right to transmit. It also minimizes garbled and incomplete transmissions that result from interference so common in metropolitan areas. NBC is installing Ku-band satellite antennaes from Harris Corp. that will handle program transmission between central New York headquarters and 179 affiliate stations in major cities.

The second advantage of Ku-band networks is that they are accessed through very small aperture terminals: satellite dishes that are approximately 2 or 3 meters in diameter. Most C-band earth stations have a diameter of 6 to 7 meters. The market for very small aperture terminals is in the "pilot stage this year," according to one Vitalink Communications Corp. spokesman. "Last year customers were beginning to realize what the terminals can do, and vendors were focusing on customers' needs. This year there are a lot of pilot sites testing the technology."

Small aperture terminals only support one channel transmitting between 9.6K bit/sec. to 56K bit/sec., while C-band earth stations can support four or five channels.

This makes very small aperture terminals unsuitable for multiple sites that all want to talk to each other but ideal for multiple sites that all want to talk to just one central location.

The main advantage of very small aperture terminals over C-band earth stations is cost. Vitalink sells 1.8-meter small aperture terminals for approximately $50,000 apiece. The vendor's 6-meter C-band earth stations start at $125,000.

Geisco is among the growing number of businesses looking seriously at the terminals. The smallness of the dish, coupled with the Ku-band's freedom from regulatory hassles, would have made Geisco's Tampa satellite installation a whole lot easier and cheaper, Keough admitted. "We wouldn't have had to cut off a section of the dish to fit it behind the shrubbery. And where it takes between $6,000 and $10,000 to clear a C-band site, we hope to be able to be able to solve our small aperture terminal installation problems for around $2,000 apiece."

Tymstar satellite facility available

From page 29

nal stages of negotiation, a Telenet spokesman reported.

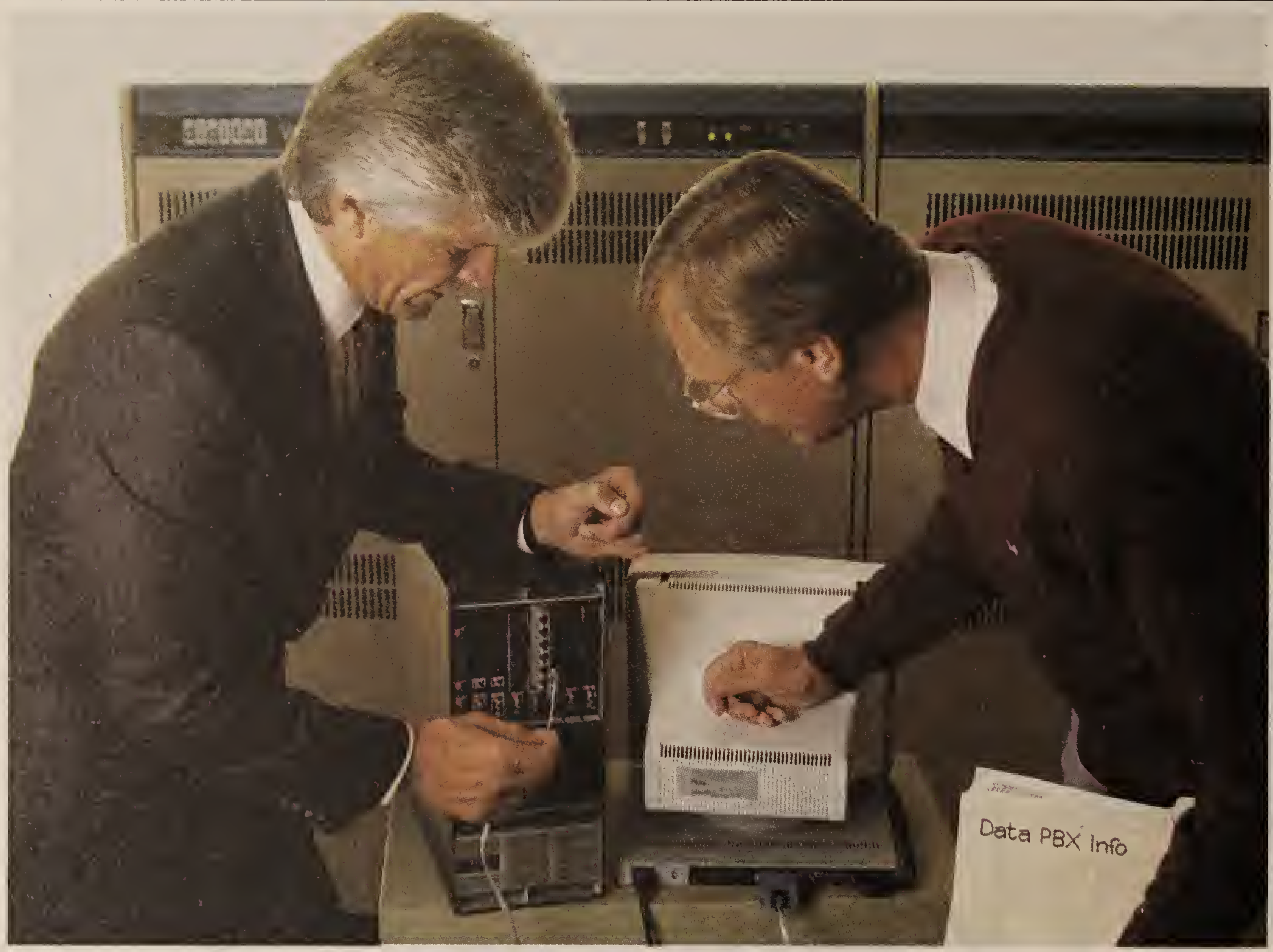
Skystar's services are very similar to those offered by Tymstar. But while Telenet has integrated packet-switched capabilities into the small aperture terminals it installs on customer premises, it offers no gateway between satellite and packet-switched services.

GTE leasing

Indeed, GTE only leases satellite transponder space, assigning companies bandwidth or time slots on a particular band. It does not charge on a per-usage basis, so there is no public Skystar network similar to Tymstar's. "Satellite and public packet-switched facilities are used for very different user applications," a Skystar spokesman said.

John Holmblad, vice-president of marketing at Telenet's network systems division, explained what he thought was the most important difference between the two competitors: "We own the transponder space; Tymnet leases it from us and resells it to customers. That has to mean we can provide a more competitive price to customers. And it also means we offer end-to-end satellite networking through the Spacenet subsidiary. It's a major undertaking to set up a satellite network, and we feel we have greater expertise."

Another potential competitor in the packet-switched/satellite market is AT&T. Rumor has it that the telecommunications giant will soon be offering satellite-based services in conjunction with satellite equipment supplier Harris Corp. "We all expect them to," Tymnet's McWilliams commented. "It's a natural migration for them. Companies already in the satellite service business are already encroaching on their business, so it stands to reason they'll get into it themselves."



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SMALL TALK
Eric Bender
CW Senior Editor

More entrants in DBMS bout?

Although Ashton-Tate dominates the competition, dozens of firms continue to scrap in the micro data base management system arena. "An unbelievable number of data bases are marketed," said Paul Cubbage, software analyst with Dataquest, Inc. "There's a zero-sum battle going on."

Dataquest estimates that U.S. sales of micro DBMS software, including file managers, totaled $311 million last year. "As people mature in the use of spreadsheets and realize their limits," they will increasingly turn to DBMS software, Cubbage predicted. "Spreadsheets are a terrible way to store and retrieve data."

As this shift occurs, some observers also said they expect mainframe and mini software vendors to expand their penetration of the micro DBMS market.

Information Builders, Inc. claims to be the second largest supplier of DBMS products for the IBM Personal Computer, with sales of its PC/Focus software exceeding $17 million in 1985. "Corporations are going to stick with the programs that understand DP and the systems they need," said David Feldstein, vice-president for micro products.

Mainframe software vendors are moving to support distributed environments in which "the PC effectively becomes an extension of the mainframe," and users can access data without worrying about barriers between machines, noted A. David Tory, senior vice-president for planning at Computer Associates International, Inc.

Tory, however, emphasized that two very distinct DBMS markets remain. "The banging of heads has been very

See **MORE** page 40

Microsoft tools provide common compiler base

By Peggy Watt

BELLEVUE, Wash. — Microsoft Corp. is beefing up its software development products by separating selections into clearly defined high- and low-end lines, with the more sophisticated new languages featuring common compiler technology and a symbolic debugger.

The low-end selection, which Microsoft calls its hobbyist/educational line, is led by the $99 Quick Basic product introduced last fall. The line soon will include a Quick C and other new language compilers.

Newest in the high-end line, which is built on most of Microsoft's existing language products, is Release 4 of Microsoft's C Compiler, which is due out in March, according to Steve Snyder, director of languages in Microsoft's systems software group.

The new C compiler will be the first to offer Microsoft's new common compiler technology, which reportedly makes it easy to mix languages in a single project because runtime routines and libraries can be reused without converting code.

"Integrating compilers is a big part of our strategy, said Rob Dickerson, Microsoft systems software group marketing manager.

"It's a big benefit for companies concerned about flexibility," he added. "The problem with languages that scares a lot of managers is the cost of switching development languages," including time to convert files and sometimes retrain programmers.

With the common compiler, a programmer could write new code in a different language on top of older code or use libraries from earlier programs written in another language, Dickerson said. He said that performance should also improve, with faster runtime software and tighter programs.

Microsoft's C is the first to use the new common compiler, but Pascal and Fortran will soon follow, Dickerson said.

The common compiler is also the precursor to an interactive symbolic language debugger under development, the seeds of which will also be found in the new C,

See **COMPILER** page 38

Hypergraphics HG Storybook brightens presentations through color, animation

By Douglas Barney

DENTON, Texas — Hypergraphics Corp. has announced a $175 presentation graphics package, HG Storybook, which can create animated demonstrations, client presentations, in-class training presentations and sales and marketing messages.

"We see this as an easy-to-use tool for the corporate-type customer who is in the process of putting together a quick presentation for a group, a rolling demo for a product or a little instructional piece for a product," Hypergraphics President Darrell Ward said. "Our system allows you to see things dynamically."

HG Storybook can combine text, color and animation on one screen. It offers branching, permitting different responses on the basis of answers to questions asked during the presentation. External program references also are supported, allowing the user to exit HG Storybook to go to another program and return to the same place within HG Storybook.

Users can choose colors, style and timing of presentations through pop-up edit status windows and pop-up menus and can create and edit using a keyboard or mouse.

The package includes an on-line encyclopedia, which serves as a reference manual, and an on-line tutorial. Through the use of HG Photo, a utility included in the program, text files and graphs from other

See **HYPERGRAPHICS** page 37

INSIDE

Micrografx offers Draw, a graphics package that enhances Lotus' 1-2-3 and Symphony output and runs under Microsoft Windows/**37**

NEW THIS WEEK

- Apple Computer upgrades Apple II Pascal
- For more on this and other new products, see pp. 99-128.

INSTANT ANALYSIS

"It would be highly useful for people in the compact disk read-only memory business to consider existing ways micro users are updating, organizing, extracting and outputting data now. . . . Products are likely to gain more acceptance if users don't have to learn a whole new method."

— David Hull, director of product marketing for data base products at Ashton-Tate

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Oracle unveils productivity tools for SQL/RT on the IBM RT PC

Oracle Corporation has announced six software products for the newly-announced IBM RT PC system. The packages run with IBM's SQL/RT relational DBMS, which was developed by Oracle for IBM. Oracle also announced immediate availability of its full ORACLE product line on the RT PC/AT co-processor.

According to Oracle Director of Product Marketing, Ken Cohen, "The SQL/RT product which IBM is marketing on the RT PC provides a robust relational DBMS. Since Oracle was the source of SQL/RT, we feel well-suited to offer our other products directly. They provide even greater flexibility and decision-support capabilities to RT PC users."

☐**Pro*Fortran**: The Pro*Fortran precompiler allows RT PC programmers to embed SQL database language statements in the middle of their Fortran programs. It is intended for Fortran programs which must access or manipulate SQL/RT database information.

☐**Pro*SQL**: Pro*SQL is a general-purpose call-interface to SQL/RT. Using a simple set of programming calls from a variety of languages supported on the RT PC, the programmer can access SQL/RT.

☐**SQL*IAF**: The SQL*IAF (Interactive Application Facility) package is a complete application generator and run-time system for forms-based applications. It is a complement and extension to the Easy SQL/RT component of IBM's SQL/RT.

The SQL*IAF screen painter lets users design forms using *what-you-see-is-what-you-get* techniques. Multi-table query/update forms can be easily produced for demanding applications. Also, SQL*IAF lets users apply data editing and validation criteria to data entered into forms. Finally, SQL*IAF provides extensive support for non-IBM terminal types, such as DEC's VT-220.

☐**SQL*RPT**: SQL*RPT is a report writer and formatter for use with SQL/RT. Using simple commands, users can create reports of almost unlimited sophistication from their databases.

The database information can also be included in documents formatted with SQL*RPT, allowing text and database processing to be combined in one easy-to-use interface suitable for developers and end-users alike.

☐**SQL*Calc**: SQL*Calc is a Lotus 1-2-3 compatible spreadsheet integrated with the SQL/RT DBMS. Users can place SQL statements into the cells of their spreadsheets, retrieving and updating SQL/RT data automatically. Large SQL/RT databases can be shared among spreadsheet users, with all of the database instantly available to them.

☐**SQL*Link**: SQL*Link provides a micro-mainframe link which allows intelligent transfer of database information between SQL/RT on the RT PC and the ORACLE relational DBMS running on IBM PCs and a variety of mainframes and minis.

SQL*Link lets users exchange information between PCs with ORACLE and the RT PC, with the RT PC serving as a Host.

The package also lets users of SQL/RT exchange database information with a mini or mainframe running ORACLE.

☐**PC/DOS Support**: The ORACLE relational DBMS, 4GL and DSS tools are also available to run on the IBM RT PC/AT co-processor option.

Oracle produces and markets the ORACLE relational DBMS, 4GL and DSS software. ORACLE runs on a wide range of computers, including IBM mainframes, DEC, DG, HP, Stratus and most other minicomputers, and a wide variety of micros, including the IBM PC family.

Oracle distributes its products through a worldwide network of 30 direct sales offices, through the Authorized Oracle Dealer network, and through VARs which participate in the Oracle Alliance program. With its direct and OEM marketing efforts, ORACLE is used by 39 of the top 50 multi-national corporations and at thousands of sites overall.

For further information, contact Oracle Corp., Dept. CWST3, 20 Davis Drive, Belmont, CA 94002, 1-800-345-DBMS.

Macintosh Plus gathers third-party product support

Vendors take advantage of machine's potential

By Peggy Watt

SAN FRANCISCO — Unlike the case of the original Macintosh two years ago, Apple Computer, Inc.'s Macintosh Plus arrived with a large family of third-party products.

Third-party developers for the Macintosh focused on its shortcomings, including minimal storage, slow speed and limited expandability, problems the Macintosh Plus addresses. Consequently, the newest software and hardware add-ons aim at exploiting the machine's potential more than correcting its perceived omissions. Also, many current product suppliers enhanced their offerings to take advantage of the Macintosh Plus' features.

Among the noteworthy third-party products announced in conjunction with the Macintosh Plus' unveiling at the Macworld Exposition last month were the following:

■ Inbox, from Think Technologies, Inc. of Lexington, Mass., offers a palette of on-line applications for networked Macintoshes, including electronic mail, memo pads and file sharing, with an easy interface in the Macintosh style. A starter kit costs $295, including three nodes; additional connections cost $75. Shipment is promised this quarter.

■ Hayes Microcomputer Products, Inc., Atlanta, announced Interbridge for local or remote connections expanding Apple's Appletalk network and expanding use of shared peripherals. Networks can be connected over standard telephone lines. The $799 program includes two Appletalk connectors and two RS-232 ports; it also supports the Hayes Smartmodem 2400.

■ Macserve, a network disk and printer software program, allows peripheral sharing for as many as 16 Macintoshes linked by Appletalk and was introduced by Infosphere of Portland, Ore. Macserve takes advantage of hard-disk and tape backup systems that use the small computer systems interface (SCSI) and is priced at $250.

■ Super Crunch, an enhanced version of the spreadsheet Crunch from Paladin Software Corp. of Santa Clara, Calif., will ship this month. The new $295 program adds macros, more work sheet space and numeric keypad support.

■ A 74M-byte hard disk with 60M-byte streaming-tape backup subsystem will be available in February from AST Research, Inc. of Irvine, Calif. The $6,995 AST-4000 is based on the AST Colossus line developed for the IBM Personal Computer family and can be expanded to 370M bytes of hard-disk capacity with optional expansion units.

■ Readysetgo, a desktop publishing program from Manhattan Graphics of New York, was upgraded to include random-access memory (RAM)-resident capabilities on the Macintosh Plus. It costs $195.

■ Macpublisher II desktop publishing software from Boston Software Publishers, Inc., Boston, was enhanced to take advantage of the Macintosh Plus and Apple Laserwriter Plus but runs on other models. New features of the $149.95 package include better access to pages and files from other applications.

> **”**
>
> ***The newest software and hardware add-ons aim at exploiting the machine's potential more than correcting its perceived omissions.***

■ Adobe Systems, Inc. of Palo Alto, which developed the Postscript communications language used by the Apple Laserwriter, introduced 12 new typeface packages. The price is $185 per single-printer package and $375 for a multiprinter license. Adobe promises another six packages will be released during the year.

■ Maccharlie from Dayna Communications, Inc. of Salt Lake City, which enables the Macintosh to run Microsoft Corp. MS-DOS software, was enhanced for the Macintosh Plus. Maccharlie Plus includes a single disk drive, 256K bytes of RAM, 20 function keys, Apple's Switcher and Microsoft MS-DOS 3.1 and GW-Basic for $1,295.

■ The Chromatron, from Beck-Tech Corp. of Berkeley, Calif., is a video scan converter for the Macintosh and Macintosh Plus, available for $2,995. It converts Macintosh video output into standard television signals and can assign colors to patterns created by common Macintosh graphics programs.

Beck-Tech also announced the animation software Macmovies, priced at $99, and the Macanimation Station package, including software, hardware and hard disk, for $4,995. Both products will be available March 1. Also available will be Beck-Tech's Macmegabytes 2+ 2M-byte memory expansion board for the Macintosh

See **MAC** page 40

How is Duquesne Systems teaching Fortune 500 companies to share?

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IBM Personal Computers get DBMS, application generator

XDB marketing effort targets users, OEMs

By Mitch Betts
and Bryan Wilkins

COLLEGE PARK, Md. — Software Systems Technology, Inc. (SST), has released a high-end, relational data base management system and applications generator called XDB for use on IBM's Personal Computer line and compatibles. The product will compete with Ashton-Tate's Dbase III and Microrim, Inc.'s R:Base 5000 and will be marketed directly to users and to major OEMs, SST Chairman Bing Yao said.

XDB can be used as an applications generator by expert users or as a menu-driven data base manager by nonprogrammers, he said. The product costs $750. Volume discounts and site licensing are reportedly available.

Because it uses a query language based on IBM's SQL, the product can access data bases stored on IBM mainframes, he said.

Beta tested for two years

The software has been beta tested for two years. James Hsu, vice-president of General Software Corp., a software development firm in Landover, Md., said he has used XDB to prototype and develop applications for micro users at the National Aeronautics and Space Administration.

Hsu said XDB is flexible enough for use by both novice and experienced programmers, and he praised its forms generator in particular.

Randall Rustin, director of advanced technology for the accounting firm of Coopers & Lybrand in New York, also has used XDB for application prototyping. "I can actually sit down with the user and put out a complex application in one or two days," he said.

XDB's features include a report writer, graph writer, forms manager, menu generator, an interactive command language, an import/export facility for transferring data from other files and a C language interface, SST reported.

XDB is said to require up to 320K bytes of random-access memory. Because the software comes on four diskettes and requires 1M byte of memory to store all of the modules, Yao said that XDB is best suited for hard-disk systems.

According to Yao, SST is developing a Unix-based version and a networking version. The latter is important because the next generation of data base software must have multiuser capabilities, said Robert Lefkowits, a market analyst for Infocorp in Cupertino, Calif.

Hypergraphics package bows

From page 35

programs can be saved for use in an HG Storybook presentation.

In addition to the package, customers receive a Portfolio Library of 60 professionally drawn images for use in the user's own presentations.

Although the product is currently in beta test, Hypergraphics will ship a final version in February, said Craig Vanbebber, Hypergraphics director of public relations.

HG Storybook runs on the IBM Personal Computer, Personal Computer XT, AT and compatibles with IBM PC-DOS 2 or higher, 320K bytes of random-access memory and an IBM or compatible color graphics adapter card.

Microsoft signs agreement to resell Draw graphics presentation tool

RICHARDSON, Texas — Micrografx, Inc. has announced a marketing agreement with Microsoft Corp. involving a graphics presentation program that will operate under Microsoft's Windows program. Under the agreement, Microsoft gains the right to resell Micrografx's Draw to its OEM customers.

Draw, a $199 package that Micrografx said can incorporate and enhance Lotus Development Corp. 1-2-3 and Symphony graphics, is scheduled for retail shipments at the end of the month.

Draw is the second Windows-compatible software product announced by Micrografx. Last year, the company introduced a $495 computer-aided design package called Inavision for the IBM Personal Computer line and compatibles that included an option to run under Windows.

Tandy Trower, director of marketing for Windows at Microsoft, said the arrangement with Micrografx was "an opportunity because, at that time, we had no Windows product offerings in our own applications area." J. Paul Grayson, chairman of Micrografx, said the reseller agreement with Microsoft will benefit his company because Microsoft is "stronger and a lot bigger than we are."

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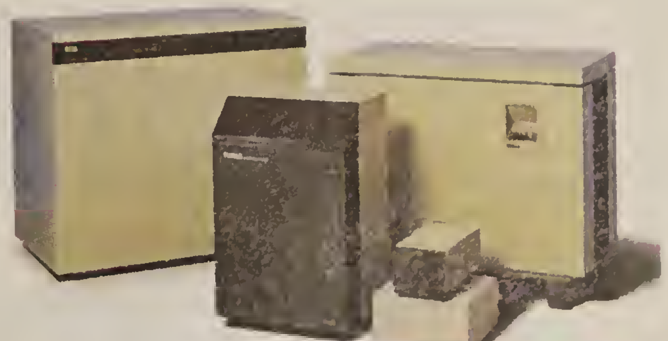

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Compiler tools to be offered

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Dickerson said. The debugger will include pull-down menus, windows and will enable programmers to observe variables changing with code changes.

The next version of Fortran, due out this year, will also contain elements of symbolic debugging, and the common debugger will be folded into each subsequent language update and release, product managers said.

Developing such across-the-line compiler and debugger technologies will make Microsoft's internal development work easier, since the developers can concentrate on features specific to a language and use the common technology for other aspects of a product, Dickerson added. He predicted that the emergence of such development tools on microcomputers that have not been feasible on larger systems may eventually make micros attractive for mainframe software development.

Most of Microsoft's current line of programming language products, including Pascal, Cobol, LISP and assembler , constitutes what the company said it considers to be its high-end group. They are aimed at what Microsoft calls "the pros" — data processing managers and independent software vendor customers who are less price sensitive and more concerned with getting the job done than the fun or educational value of development.

Another hallmark of the high-end family will be thick and thorough manuals, since "pros aren't afraid of documentation," Dickerson said. "We're making it more extensive."

Though emphasis for high-end language improvements has been on Microsoft MS-DOS products, Xenix family enhancements are not far behind, Snyder said. Microsoft offers six languages for its Xenix systems, and a Basic compiler is in the works as the next release with a new version of Cobol to follow, he added.

Facilitate MS-DOS-to-Xenix move

"We're moving everything over to Xenix. The whole idea is to make it easier for our MS-DOS customers to go to Xenix" by making ports easy, Snyder said.

Microsoft also continues to support its line of CP/M software development tools, which Snyder said straddle the high-end and Quick families.

The company's GW-Basic is now primarily an OEM program, usually sold with MS-DOS to computer companies that want to offer a Basic programming language for IBM Personal Computer-compatible systems. Snyder said he expects competition in that field to come from the likes of Borland International's economy-priced but powerful Turbo Pascal. The programs were designed for beginners and more experienced hobbyists but lack many of the extra features a professional would need and want, he said.

Quadram to expand link line

Host access products to target IBM units

NORCROSS, Ga. — Quadram Corp.'s communications product group is expanding farther into the micro-to-mainframe link technology market, a spokeman recently told *Computerworld*. Quadram will announce the creation of the Mainlink line of host access products and will unveil the first four products in the line in February.

Mainlink will include both local and remote 3278 and 3279 emulation boards for the IBM Personal Computer and compatibles, 3270 Personal Computer emulation boards and local and remote gateways. "Our emphasis will be on providing total connectivity, compatibility, flexibility and upgradeability in the 3270 environment," according to Wil Riner, president of Quadram's communications group.

The product expansion is a result of a recently signed distribution agreement between Quadram and CXI, Inc., a micro-to-mainframe vendor based in Palo Alto, Calif.

Quadram's communications product group currently offers only one micro-mainframe product, the Quad 3278, an emulation board for Personal Computers and compatibles. Quadram will soon release a "totally revamped" version of that board in accordance with the Mainlink series, a spokesman said.

— James A. Martin

Micro Data Base Systems ships Guru

LAFAYETTE, Ind. — Micro Data Base Systems, Inc. has begun deliveries of Guru, an integrated microcomputer software package. Guru reportedly combines expert system and natural language features with data base management, spreadsheet, text processing, graphics and communications functions.

The company said that initial sales of the $2,995 IBM PC-DOS package surpassed $6 million at the retail store level.

Guru versions for personal computer local-area networks and Digital Equipment Corp. VAX systems will be released soon, according to Micro Data Base Systems.

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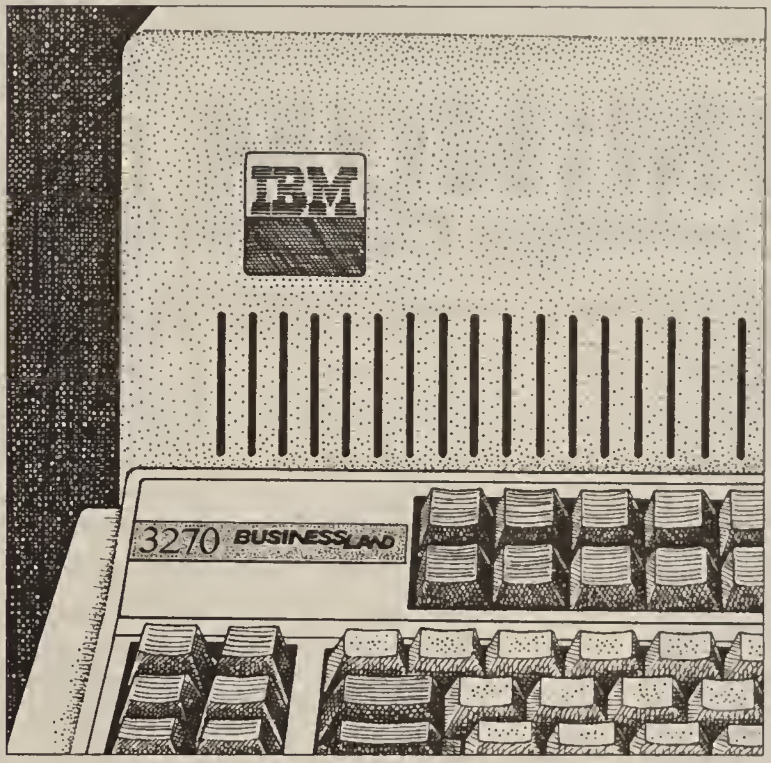

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Mac arrival gets support

From page 36

and Macintosh Plus, priced at $995.

■ Spectrafax Corp. of Naples, Fla., has a first-quarter shipping date for a Macintosh version of its Spectrafax color scanner, which can transmit the material by facsimile machines over standard telephone lines. The price is $3,995.

■ External hard disk drives of 20M bytes and 30M bytes for the Macintosh Plus were unveiled by MDideas Inc. of Foster City, Calif. The drives use the new SCSI expansion port and are small enough to sit on top of a Macintosh. Prices are $1,095 for the HD-20 and $1,595 for the HD-30.

■ Micah, Inc. of Sausalito, Calif., this month will ship its Micahdrive 10 AT and Micahdrive 20 AT internal hard disk drives for both standard Macintoshes and the Macintosh Plus. The drives use the SCSI interface and include controller, fan and power supply. The 10M-byte drive costs $1,495, and the 20M-byte drive costs $1,895.

■ The Slimline Hard Disk Subsystem for the Macintosh Plus that connects a 20M- or 30M-byte disk with a 10M-byte cartridge drive through the SCSI port was announced by Univation, Inc. of Sunnyvale, Calif. Prices begin at $2,795, with shipment to begin in late February.

■ Dataframe, a 20-M byte hard disk drive from Supermac Technology of Mountain View, Calif., communicates through the SCSI port. It costs $1,095 and will be available in mid-February.

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More DBMS entrants?

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indirect; Ashton-Tate doesn't see us as competition."

"Seemingly that's a logical extension of their business," said David Hull, director of product marketing for data base products at Ashton-Tate. "But microcomputing is very different."

Other large systems software vendors have not joined the battle. "There hasn't been a tremendous outcry from the customer base to provide those facilities," said Dwight Mundwiler, a product manager at Applied Data Research, Inc.

And the market has not seemed quite dazzling enough to attract the largest suppliers, according to Michael Lobsinger, vice-president at Compuware. "Until that demand is big enough, the big boys aren't going to play."

Many, however, said they expect the other major micro application vendors to enter the market. For both Lotus Development Corp. and Microsoft Corp., DBMS is "a missing card in their decks," Cubbage remarked.

"I don't see Lotus going head to head with Ashton-Tate," Alpha Software, Inc. President Richard Rabins said.

Rabins predicted that Lotus would be more likely to offer a central product functioning on a network file server, sending out applications and data to network terminals. "That's very different from an application generator," he said.

Although Microsoft does not offer data base management system products for the IBM Personal Computer, Chairman William Gates recently noted that for network offerings, DBMS is "the big one, the one where you really take advantage of the server."

Price hikes announced for tools

Among the flood of product announcements from IBM on Jan. 21 were price increases for several third-party microcomputer software application packages and enhancements to software that permits Personal Computers to emulate IBM 5250 terminals.

The cost of Borland International's Sideways rose from $60 to $69.95. Three Microsoft Corp. applications, which were recently enhanced, also had prices raised.

The cost of Microsoft Chart was boosted from $250 to $295; the Microsoft Project was increased from $250 to $395; the price of Microsoft Word rose from $375 to $395.

Communications offering

IBM's Enhanced 5250 Emulation Program Version 2.1 is available immediately. The product is said to be a $160 communications software offering for attaching the Personal Computer, Personal Computer XT, Portable Personal Computer and Personal Computer AT to the IBM System/34, System/36 or System/38.

Enhancements to the version include Host Graphics Support with IBM 5292 Model 2 emulation for host Business Graphics Utility programs, table-driven printer support for a variety of IBM and NEC Corp. personal computer printers, and keyboard enhancements, the vendor said.

Serial printer attachments, the Enhanced Graphics Adapter and the Professional Graphics Controller reportedly also are supported.

Program upgrades cost $50.

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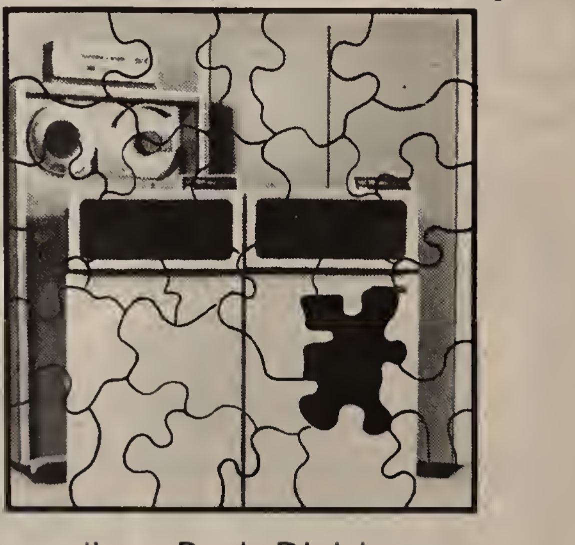

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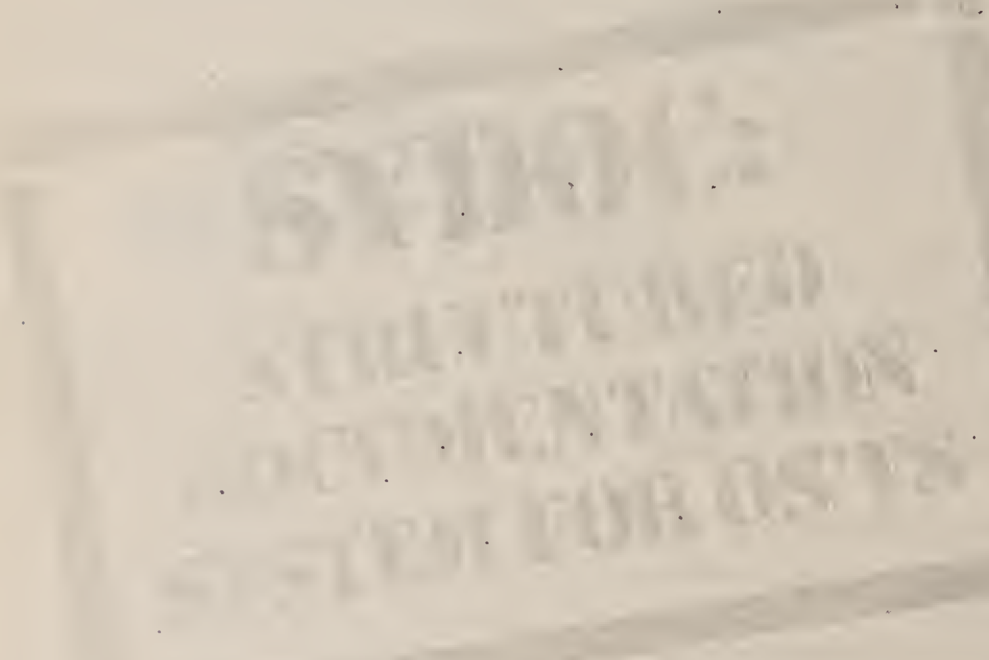

QUESTION: Which is a bigger headache? The COBOL-documentation problem or the high-cost-of-maintenance problem?

ANSWER: Both.

* * *

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2. BAD DOCUMENTATION LEADS TO COSTLY MAINTENANCE: Even if the documentation started out being accurate, it's probably never been updated. When modifications occur, someone's got to go back and attempt to divine the underlying logic before new code can be inserted. A long and costly operation.

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SOFTWARE & SERVICES

SOFTLINE
William Inmon

Managing dual data bases

FIRST OF TWO PARTS

If there is a single unresolved, profound issue facing DP managers in the mid-1980s, it is that of a dual data base. Data base management system vendors bombard the manager with literature, end users demand more and faster systems and upper management increasingly grows uneasy with the way data is managed as a corporate resource. Behind these disparate forces is the issue of data base itself — how to use it, where to use it and what data base strategy to embrace..

Data base grew up in the late 1960s and early 1970s as an approach to solving the problems of magnetic tape master files and their attendant encumbrances, which were many. The first theories of data base recognized the need to reduce the enormous level of data redundancy inherent in a magnetic tape master file environment. In the early days of data base, there was only one DBMS in most shops. As such, the early DBMS software packages were all things — that is, all data base things — to all people.

But as time progressed and the data base environment expanded, the requirements for data base likewise expanded. At the production or operational level, on-line performance, a high level of availability and the ability to handle large amounts of data became the primary needs. And at the management, or decision support systems (DSS), level, there arose a need to build applications quickly and to be able to change them easily. These conflicting needs were soon stretching early DBMS to the limit.

In time, the conflicts between the

See **DUAL** page 48

Inmon is a director at Coopers & Lybrand in Denver, a noted author on the subject of data base design and a regular contributor to Softline.

Industry leader speaks out

Software AG exec tackles relational, pricing issues

INTERVIEW

John Maguire, chairman of Software AG

As chairman of Software AG, John Maguire is a key player in two of the most rapidly growing software markets — markets tinged with controversy. Software AG, which Maguire founded in 1972, is a leader in the data base management system field with its widely installed Adabas and in the fourth-generation language mart with Natural. Outspoken and candid, Maguire recently spoke with Computerworld *Senior Editor, Software, John Gallant, on the continuing relational DBMS debate, the state of fourth-generation languages vs. Cobol and functional pricing of software.*

The controversy over relational DBMS shows no signs of abating. Why?

John Cullinane went way out on a limb in response to the *Computerworld* articles by E. F. Codd [CW, Oct. 14; Oct. 21]. Cullinane was dismissing Codd as just an interesting academic. But you can't dismiss Codd; he is a man of great vision. But Codd is also a mathematician and a purist, and those of us trying to solve practical problems still have to do the payrolls and all that stuff. We have to sell software that solves problems in a reasonable manner.

Relational systems have been horrible on performance. But as we move forward technically with Adabas, we will have the relational view for those people who need it. But we are not beating the band claiming to be relational. That is what happened to Cullinet Software, Inc. and Applied Data Research, Inc. Relational was a buzzword, so they put big ads everywhere saying, 'We are relational.' Software AG did not say that. We said we are cost-effective, and we have got something that looks relational.

How do you feel about the statements Codd has made about vendors' failure to live up to his rules?

It is the vendors' fault; they are the ones who claimed they were relational. It is not Codd's fault. He has provided the definition of a pure relational model. We are not purely relational, we don't claim to be. But the other guys wanted a free ride

See **INDUSTRY** page 47

SOFTWARE NOTES

Yourdon extends Workbench line

New York-based **Yourdon Software Engineering Co.**, founded by software engineering and structured methodology guru **Edward Yourdon**, has introduced the second component of its microcomputer-based **Software Engineering Workbench**. The new **Designer Toolkit** ($3,500) is aimed at systems designers and incorporates Yourdon's proprietary structured design charts and data dictionary interfaces that allow users to link with other microcomputer, minicomputer and mainframe packages. Scheduled for shipment in the second quarter, the Designer Toolkit was unveiled in con-

See **NOTES** page 44

System/38 user sees strategic advantages to CPF Release 7

By Charles Babcock

FAIRFIELD, N.J. — The latest upgrade of IBM's System/38 operating system, the Control Program Facility (CPF), has many strengths and a few quirks.

That was the message Robert Cozzi Jr., editor and publisher of the Glen Ellyn, Ill.-based *Q38 Technical Journal*, had for users at a recent meeting of the New Jersey chapter of the Northeast System Thirty-Eight Users organization. Release 7 of CPF was made available in November. If a show of hands at the meeting was any indication of the newest version's acceptance, about 15% to 20% of System/38 users said they have installed it. Only about 5% of the members of the New Jersey

See **ADVANTAGES** page 45

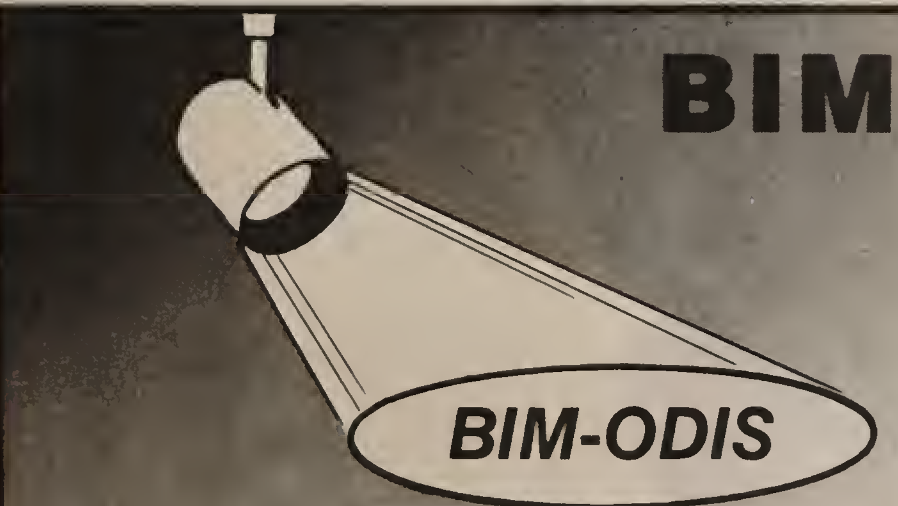
NEW THIS WEEK

- Unitech Software offers Usecure, system security for Unix systems
- Computer Associates upgrades CA-Jars family for MVS environments
- For more on these and other new products, see pp. 99-128.

INSTANT ANALYSIS

"The demise of Cobol is inevitable. As each company improves the performance and functionality of its fourth-generation language product, it will roll over Cobol just as we are now."

— **John Maguire, chairman, Software AG, on Cobol vs. fourth-generation languages**



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Notes: Issco slashes prices

From page 43

junction with the release of new versions of the first Workbench component, the **Analyst Toolkit**. The Analyst Toolkit ($3,500) will now run on most **IBM Personal Computer** compatibles and supports mouse-driven color graphics input and a wider range of hard-copy peripherals. The package was recently selected by **Hartford Integrated Technologies, Inc.**, a subsidiary of **Hartford Insurance Group**, to be part of its **The Solution** [CW, Feb. 3] software development system. Yourdon himself has authored a book titled ***Nations At Risk: The Impact of the Computer Revolution*** (Yourdon Press, New York), which focuses on how the lack of "abundant, high-quality, reliable software threatens to asphyxiate companies across the land."

■

Here's some good news in this era of rising software prices. **Integrated Software Systems Corp.** (Issco) has reduced by roughly one-third the price of its **Disspla** graphics software for **Digital Equipment Corp. VAX-11/780** and **IBM 3083** processors. By cutting the price of the widely installed package from $21,500 to $14,800 on the VAX and from $32,000 to $22,000 on the 3083, **San Diego**-based Issco said it hopes to "encourage organizations to upgrade to the level of complex graphics applications available with Disspla."

■

Buffalo, N.Y.-based **Computer Task Group, Inc.** has signed a licensing agreement through which it will offer **Cortrans' Cortex** product in the **U.S.** Cortex is said to speed conversions from **IBM's DOS** operating system to IBM's **MVS** through so-called mass migration technology that quickly transfers all DOS source material to the MVS environment. With the product, the entire conversion can be completed in roughly six months, a spokesman said. Cortrans is based in **France**.

■

Pansophic Systems, Inc. of **Oak Brook, Ill.**, has acquired the **Graphics Division** of **Ontario**, **Canada**-based **Dataplotting Services, Inc.** Dataplotting offers the **D-Pict** line of integrated graphics software, which runs on processors from **Digital Equipment Corp.**, **Data General Corp.** and **Sun Microsystems, Inc.** Pansophic acquired the D-Pict name, ownership of six D-Pict products and licensing rights to six other packages. Pansophic, which said the acquisition was completed in an effort to broaden its product line, did not divulge the terms of the deal.

■

DEC has said it will implement **Sun Microsystems, Inc.**'s **Network File System** (NFS) protocols for DEC processors running the **Ultrix** version of **Unix**. Sun, which introduced **NFS** in late 1984, has been pushing adoption of the protocols as a standard file system. NFS is said to allow users on a network to share files transparently among systems from different vendors.

■

With the aim of developing an expert system to assist in commercial insurance risk evaluation, **American International Group, Inc.**, the **St. Paul Cos.** and **Fireman's Fund Insurance Cos.** have entered into separate software development and license agreements with **Sunnyvale, Calif.**-based **Syntelligence, Inc.** To be called the **Underwriting Advisor**, the **IBM** mainframe system reportedly will compile commercial lines underwriting knowledge and allow companies to tailor the knowledge base through policies and standards. The system will support IBM **Personal Computer** workstations linked to the mainframe software.

■

For an annual fee, subscribers to **Georgia Institute of Technology's Software Engineering Research Center** can take advantage of new software technologies in prototype form. The facility was founded recently to "identify and transfer to the private sector new software engineering technologies with high payoff potential." Also on the academic front, **Synerlogic, Inc.** has joined with the **University of Calgary (Alberta)** in a project to develop an expert system to assist in converting subject matter knowledge into com-

puter-based training courseware. Synerlogic is headquartered in **Calgary**.

■

Masscomp of **Westford, Mass.**, will market **Applix, Inc.**'s **Alis** office software for its **5000** family of micro-supercomputers.

■

The **Canadian Imperial Bank of Commerce** and **New York**-based **Vista Concepts, Inc.** will jointly develop a Canadian version of the **Vista Securities Processing System** package. The bank will be the first to use the system in multiple branches.

■

Cinnabar Software of **Austin, Texas**, expanded its testing services to include **IBM System/36** software.

■

Beaverton, Ore.-based **Quantitative Technology Corp.**'s **Math Advantage** will be marketed by **ETA Systems, Inc.** for its yet-to-be-released **ETA(10)** supercomputer. Math Advantage is a subroutine library for engineering and mathematic programming.

■

Belmont, Calif.-based **Oracle Corp.** has begun a value-added reseller program called the **Oracle Alliance**.

■

Gould, Inc. has chosen **Sherman Oaks, Calif.**-based **Quadratron Systems, Inc.'s Q-Office+** as the office software for its **Powernode Series 6000** and **9000 Unix**-based systems.

Advantages to CPF release

From page 43

group, however, indicated that they had put Release 7 into production.

Cozzi is a widely known System/38 user whose utility programs and IBM RPG programming techniques are used by many of the 8,000 subscribers to the monthly journal. The Q38 name in *Q38 Technical Journal* is derived from the fact that names of IBM System/38 software packages begin with the letter Q.

IBM said Release 7 is the largest version of CPF ever issued and includes many strategic features. Cozzi highlighted several of them.

Under Release 7, the Select/Omit function has become a dynamic command that reduces degradation of system performance, Cozzi said. The System/38 operating system has always offered a logical view of physical data, allowing a user to employ multiple criteria in a key for searching an existing file and creating a new one.

However, if a user wished to search multiple files, each file required its own key and own access path. "Now when you have multiple Select/Omit criteria for different files, they can run dynamically with one access path being shared by all the files," Cozzi said.

Join function

In addition, a Join function has been added to CPF's data management facilities that can combine physical files logically, Cozzi said. A file with an account name, a second file with an address and a third with payment data can all by combined into a new flat file or a single record through a common key, he said. Earlier releases of CPF did not include the Join function.

Release 7 also allows "multimember processing, a nice utility for System/38 programmers," Cozzi said. "Member" is a System/38 term to describe what would be a single file on other machines. On the System/38, however, more than one member can be included in the same file, and users frequently store related files together as members.

"Your source code for RPG programs would be different members in a single file," Cozzi said. Because the source codes are in a common file, a programmer could interrogate them without having to open and close files repeatedly, Cozzi said.

A bug that afflicted Release 6 of CPF has been cleared up in Release 7, Cozzi said. Previously, a user filling a data entry screen would hit the Enter key to send it into the program. If on a subsequent screen, the user left a data entry slot blank, it would be automatically filled by whatever had occupied the slot on the previous screen.

When Release 7 was first announced, RPG programs could sometimes be caught in DOLOOPS in the version. The bug was fixed in a program change by IBM, and Cozzi noted, "When IBM finds them, it is pretty quick to change them."

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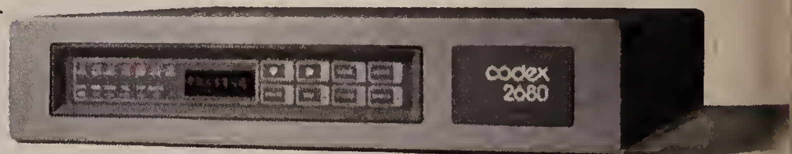
If you still have questions or would like a product demonstration, simply call **1-800-426-1212, ext.227.** Or write Codex Corporation, Dept. 707-227, 20 Cabot Blvd., Mansfield, MA 02048.



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Industry leader speaks out

From page 43

on the bandwagon, even though it will be years before you see a pure relational system that is reasonably effective and efficient for bread-and-butter processing.

How does Adabas match up with Codd's rules?

Largely, it goes beyond them. For example, Adabas can handle repeating groups and repeating fields within repeating groups, because that is what is needed in reality. Codd says you can't have that, and we won't argue with him. In the next version of Natural we will support the Join verb. Slowly but surely, we will achieve a system that embodies the major relational features that users want and use.

Is it your goal as a relational DBMS vendor to evolve toward full compliance?

Yes, but it will take years. We will put in the features that our market researchers and planners tell us have the most value in the real world. Codd is a beautiful theoretician, and he is absolutely right about the characteristics of a relational system. Cullinet and ADR got trapped trying to get on the bandwagon and claim relational. The whole thing has blown up.

Recently, we've been hearing a lot about IBM's SQL as an emerging standard program interface. Analysts say users should not ask whether a system is relational but whether it is compatible with SQL. How would you answer that question as it regards Adabas?

We have tried to broaden the ways we can get into a site now. We have a Cincom Systems, Inc. Total bridge, a DL/1 bridge, a VSAM bridge, and we have under development a Natural/DB2 bridge. In the next version of Natural we will support SQL. You'll be able to embed SQL commands in Natural programs. SQL is not going to go away, and if somebody wants to program in it, that's fine.

Many people are coming to the conclusion that fourth-generation languages are not the answer to the productivity crisis. How do you respond to that criticism?

I violently disagree. Our first version of Natural in 1979 was not a great system. But we cleaned it up. In a couple of years we had users who converted high-volume production programs to Natural to save machine time. I must violently disagree with that assessment.

The demise of Cobol is still possible?

It is inevitable. As each of the companies improves the performance and functionality of its fourth-generation language products, it will roll over Cobol just as we are now.

To what do you attribute Software AG's continued success?

We had internal problems three or four years ago, and we set about to fix them. We experienced rapid growth, and after we went public in 1981, the first major problem was instituting internal planning and control systems. We went on-line with a planning system so our expenditures would be consistent with our anticipated revenue. We tried it the other way, and it didn't work. That is combined with the quality of our products. We don't have any blemishes like the Applied Data Research and the New Jersey Department of Motor Vehicles' problem [CW, Sept. 30]. We don't have any failures, and we just recently passed 2,000 installations worldwide of Adabas, 1,850 of Natural.

Is a distributed data base possible or practical?

We've been quietly working since 1980 on a distributed data base concept called Adanet and have been implementing — slowly but surely — aspects of that. The full capability will be out this year under central data dictionary control. We are very close. In the three largest cities of Alaska, for example, there are three separate data bases, and they are talking to each other. There is logic in the programs; they know where the files are.

True distributed data processing will allow physical files to reside in different locations, even though it is one logical system. The data dictionary will know this and understand. The Alaska setup, which is a portion of the Adanet system, doesn't have the dictionary control yet. We are not quite there, but we are within shooting distance.

As DB2's performance improves and IBM begins to address the system's lack of tools, how will relational vendors like you continue to increase sales of their products?

We have been improving the efficiency of Adabas for 15 years. DB2, granting it five years, is where Adabas was 10 years ago. We're not standing still; we're improving our efficiency too. The next version of Adabas will have a continous processing option; it will be the only DBMS on IBM mainframes with a nonstop capability. That took us a little while to develop, I assure you. Even when DB2 cleans up its performance act there will still be other things that the market demands that we will have already implemented.

Do you think the recent ADR/Ameritech deal is a sign that consolidation is under way in the mainframe software industry?

No, that was just an attempt by the phone company to get into the computer industry. It was a special

See **INDUSTRY** page 48

**SAS Institute Inc.
Announces**

Lattice C Compilers for Your IBM Mainframe

Two years ago...
SAS Institute launched an effort to develop a subset of the SAS® Software System for the IBM Personal Computer. After careful study, wa agreed that C was the programming language of choice. And that the Lattice® C compiler offered the quality, speed, and efficiency we needed.

One year ago...
Devalopment had progressed so well that we expanded our efforts to include the entire SAS System on a PC, written in C. And to insure that the language, syntax, and commands would be identical across all operating systems, wa decided that all future versions of the SAS System—regardless of hardware—would be derived from the same source code written in C. That meant that we needed a C compiler for IBM 370 mainframes. And it had to be good, since all our software products would depend on it.

So we approached Lattice, Inc. and asked if we could implement a version of the Lattice C compiler for IBM mainframes. With Lattice, Inc.'s agreement, development began and progressed rapidly.

Today...
Our efforts are complete—we have a first-rate IBM 370 C compiler. And we are pleased to offer this development tool to you. Now you can write in a single language that is source code compatible with your IBM mainframe and your IBM PC. We have faithfully implemented not only the language, but also the supporting library and environment.

Features of the Lattice C compiler for tha 370 include:

- **Generation of reentrant object code.** Reentrancy allows many users to share the same coda. Reentrancy is not an easy feature to achieve on tha 370, especially if you use non-constant external variables, but we did it.
- **Optimization of the generated coda.** We know the 370 instruction sat and tha various 370 operating environments. We have over 100 staff years of assembler language systems experience on our development team.
- **Genarated code executable in both 24-bit and 31-bit addressing modes.** You can run compiled programs abova tha 16 megabyte lina In MVS/XA.
- **Generated code identical for OS and CMS operating systems.** You can mova modules between MVS and CMS without even recompiling.
- **Complete libraries.** We have implamanted all the library routines described by Kernighan and Ritchie (the informal C standard), and all tha library routines supported by Lattice (except operating system dependent routines), plus extensions for dealing with 370 operating environments directly. Especially significant is our byte-addressabla Unix®-style I/O access method.
- **Built-In functions.** Many of the traditional string handling functions are available as built-in functions, generating in-line machine code rather than function calls. Your call to move a string can result in just one MVC instruction rather than a function call and a loop.

In addition to mainframe software development, you can also use our naw cross-compiler to develop PC software on your IBM mainframe. With our cross-compiler, you can compile Lattice C programs on your mainframe and generate object code ready to download to your PC.

With the cross-compiler, we also offer PLINKB6™ and PLIBB6™ by Phoenix Software Associates Ltd. The Phoenix link-editor and library management facility can bind several compiled programs on the mainframe and download immediately executable modules to your PC.

Tomorrow...
We believe that the C language offers the SAS System the path to true portability and maintainability. And we believe that other companies will make similar strategic decisions about C. Already, C is taught in most college computer science curriculums, and is replacing older languages in many. And almost avery computer introduced to the market now has a C compiler.

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Dual data base strategy

From page 43

different forces shaping data base reached a crescendo. It was then that the notion of dual data base was born. Simply put, the dual data base approach dictates that one system be used to satisfy performance or production needs and another be used to satisfy DSS or end-user computing needs.

The dual data base strategy grew in an unstructured, undisciplined fashion and seems to contradict the concept of nonredundancy that sprang up with the overthrow of magnetic tape master files.

Two sides

There are at least two sides to the dual data base issue — dual data base as it applies to DBMS software and dual data base independent of any DBMS. Even though the issues sound the same — Does a shop need two DBMS software packages, one for performance and one for flexibility, and does a shop need a dual data base? — the issues are actually quite distinct.

Most discussions of dual data base do not make this important distinction, which is much more than a play on words. Indeed, nearly all DBMS vendors talk of the dual data base issue as it applies only to DBMS software.

But it is important to recognize that there are two very distinct issues, and not distinguishing between them greatly confuses the ensuing discussions.

The issue of dual data base as it applies to DBMS software centers on performance, usually on-line performance. The performance issue leads one to ask whether a single DBMS can satisfy the requirements of high-performance, on-line processing and the need for flexibility and rapid systems development. Without going into the specifics of teleprocessing monitors and data base management software technology, much controversy exists as to whether high-performance and flexibility can coexist in the same DBMS.

Single DBMS desirable

There is no question that a single DBMS is desirable. Every new technology involves its own support, learning curves and costs. A multiplicity of technologies is a DP manager's nightmare. For a thousand good reasons, the fewer technologies a company must come to grips with, the more stable and streamlined the organization. DBMS is no exception to this rule.

For a single DBMS to serve both performance and flexibility needs, it must be able to satisfy the following criteria:

■ An ability to separate long-running processes from short-running processes. When long-running processes are indiscriminately mixed with short-running processes, poor performance is inevitably the result.

■ An ability to do record-at-a-time processing and set-at-a-time processing on the data controlled by the DBMS.

■ An ability to cluster data within the same data base, or table, and within two or more data bases or tables into the same physical block so that access can be achieved in the same physical read or write of the data.

■ An ability to directly control index utilization and access.

■ An ability to directly control integrity protection resource utilization.

■ An ability to directly control physical data placement and organization.

■ An ability to directly control inter-data base relationships and the accessing of data across those relationships.

■ An ability to monitor and control the internal organization of data.

■ An ability to alter dynamically the content and relationship of data.

If a single DBMS is able to satisfy all these criteria, then it will meet both performance and flexibility needs. But any DBMS that cannot handle all the criteria limits itself either to the operational or the DSS camp.

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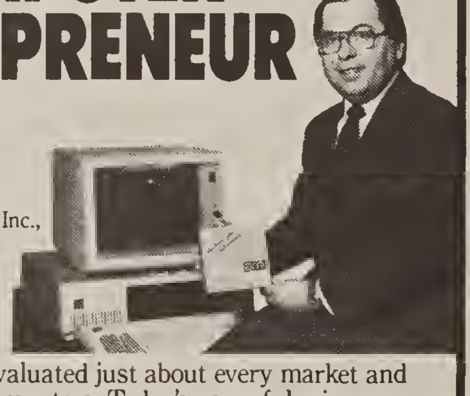

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Industry leader speaks

From page 47

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1. *Xephon User Survey.* ©1984, Xephon Technology Transfer, Ltd.
2. Computer Intelligence Corporation, 1985.
3. *Datamation,* 1984.

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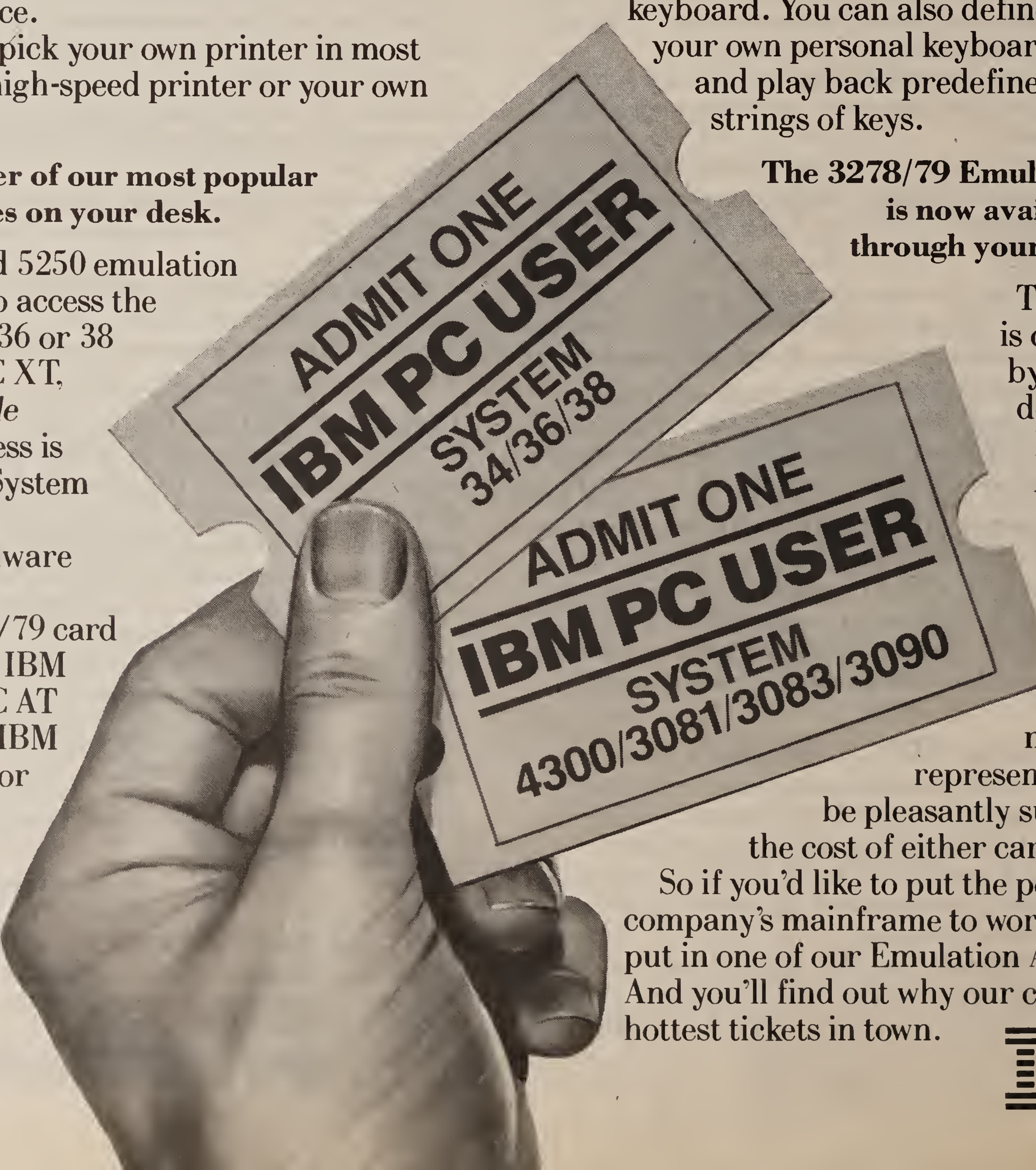

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DP as a profit center

Spin-offs can raise money and morale

By GLENN RIFKIN

In May 1970, following a two-year study of its data processing operations, Boeing Co. consolidated its diverse DP centers and broke off the DP group as a subsidiary designed to service both Boeing's computer needs and those of outside customers.

This innovative step was taken more out of necessity than crystal-ball wisdom. The worldwide recession in the late 1960s cut heavily into Boeing's orders, and the company was seeking ways to tighten its belt and control costs. In addition, the buzzword of the period was "diversify," and DP looked like a good bet for a new business. Lastly, good DP people were scarce even then, and Boeing, fearing that layoffs would frighten off key personnel, decided a new venture would keep good people motivated and busy.

Boeing's Chairman T. A. Wilson made it clear to the entire corporation that the new computer company bore the responsibility for all DP needs. "Full backing of the CEO makes a big difference," says Del Rowan, manager of executive programs for Boeing Computer Services Co. Wilson also insisted that the new company keep distinct its two missions — servicing internal Boeing needs and generating outside commercial business.

Boeing's decision to turn DP into a profit center has clearly paid off. After eight years as a wholly owned subsidiary, Boeing's booming DP business was brought back into the corporate structure as a full division.

Today, 16 years after opening its doors, Boeing Computer Services employs 12,000 people and services more than 1,500 outside customers in government, energy and manufacturing. Though Boeing will not reveal the revenue of any division, Rowan will say that if Boeing Computer Services were a separate company, it would rank among the Fortune 500. Wilson concedes that Boeing Computer Services is no doubt Boeing's most successful diversification.

It's tough to sell DP services externally. And unless the revenue potential is significant, it's not worth the headache.

Despite successes at Boeing Computer Services, Security Pacific Automation Co., General Electric Information Services Co. and McDonnell Douglas Automation Co. — all corporate giants — the push to turn data processing into a profit-making business has been relatively weak. Generally relegated to the financial, insurance and airline industries, the data center turned profit center idea has met with little acceptance in U.S. industry.

Not surprising, most DP/MIS managers are not

Rifkin is a Computerworld *senior editor.*

Spin-offs can raise money and morale

Continued from previous page

pushing for such a transformation. In most organizations they have all they can handle keeping up with corporate computing needs and burgeoning end-user demands. The idea of becoming a separate business unit or subsidiary charged with turning a profit seems like a nightmare or some absurd joke to many in the trenches.

In addition, most companies continue to employ primitive chargeback systems for DP as a cost center and give little thought to trying innovative methods for defraying DP expenses and making the department a dynamic, profitable part of the business. According to a joint survey conducted by Index Systems, Inc. and Hammer and Co., Cambridge, Mass., consulting firms, most companies still use chargeback systems based strictly on mainframe resource consumption.

"Some firms have also bundled many varieties of information systems costs into the mainframe charging algorithm, which artificially inflates the cost of mainframe usage," the survey concludes. "Such practices, which have existed for many years, have led to complicated algorithms that are confusing to users and that discourage them from making informed decisions about the value of information systems to their businesses."

Even companies that have upgraded their internal chargeback systems remain reluctant to dive into the DP business. Though many dub their DP departments "profit centers," a majority are strictly internal shops that show profit through chargeback but are not adding anything to the corporate bottom line — paper shuffling, according to one consultant.

Among the concerns preventing many corporations from converting their data centers into external profit centers are the following:

- A staff trying to market its capabilities outside may not provide quality service internally.
- The revenue potential must be extremely high for such a venture because operating margins are tight and the business is capital intensive.
- Having a good product or service is no guarantee of success. Marketing becomes a key ingredient in the mix, and most DP professionals lack that background.
- Good people are hard to find. Only a finite number of DP professionals understand the service business and also have the necessary entrepreneurial spirit it takes to make the business fly.
- The data service industry, excluding some specific niche markets, has become saturated, and anyone with a shingle and mainframe is not guaranteed to garner market share. Even big-name time-sharing firms are struggling through tough times; newcomers must offer something special.
- Companies that develop innovative applications software packages internally are reluctant to offer them on the open market for fear of losing the competitive edge that product gave them.

Consultants and analysts who have observed such spin-off ventures are unenthusiastic about the potential. "In my experience, the success rate is poor," says Ted Withington, vice-president of information systems for Arthur D. Little, Inc. "If the staff continues to try to provide internal service while conducting outside business, something suffers."

"It's very different and risky," adds Walter Ulrich, a Houston-based consultant. "When you provide software to internal users, you can tailor it to your own business needs. When you sell it to the outside world, it needs to be a more generic package."

Ulrich explains that there is a major difference between a service-oriented and sales-oriented staff. To sell outside, he says, you need both. "Many MIS departments can't make that transition. It's tough to sell externally. And unless the revenue potential is significant, it's not worth the headache."

Bob Eccles, associate professor at the Harvard

User Profile

Will it play in Peoria?

Turning the data center into a profit center can offer more than just bottom-line benefits to the company. Witness Caterpillar Tractor Co. of Peoria, Ill.

Times have been tough for the smokestack industries of America's Midwest, and huge companies such as Caterpillar feel the heat. Since 1981, the $6.5 billion heavy equipment manufacturer has pared its work force from 33,000 to 19,000 in the Peoria area alone. Caterpillar's DP department, aware of the ill effects the cutbacks have had on the community, embarked on a project to start some of those affected workers on new career paths.

Following an innovative plan devised by Bert Walker, manager of the information services division at Caterpillar, the DP department early last year spun off an embryonic group attempting to function as a profit center. Walker's new group offers outside customers DP services, but its main function is to train unemployed workers as DP professionals and then sell this new pool of programming talent to major data processing service companies.

Caterpillar's Bert Walker

"Caterpillar has a 20-year history of developing DP talent internally," Walker says. Rather than looking for the experienced professional, Caterpillar has recruited much of its 2,000-member DP staff from high school, junior college and college graduates. The company then trains the recruits internally in such disciplines as big systems, business applications, programming, systems analysis and project leadership.

The results of this internal training not only produced what Walker terms "a very strong DP staff" but also gave Caterpillar's DP department expertise in education. With that experience as a foundation, Walker sought out local, state and federal funding available for retraining unemployed workers and received the go-ahead from Caterpillar to embark on his venture.

With a staff of four and some minor expense money, Walker's project was mandated to be in the black by year-end 1985 or else it would be aborted. After passing that test, Walker was given an expanded staff and a budget of $600,000 for 1986. The target for this year is a net revenue of $2 million beyond that $600,000 budget. This funding allows for a minimum amount of research and development and marketing to expand the business. "It's entirely a bootstrapping operation," Walker says.

Walker admits that he picked a difficult time to initiate his plan. Like other companies dependent on the ailing agriculture industry, Caterpillar continues to face economic woes and is not inclined to spend large sums on start-up ventures. Had it been interested in a data services business, it likely would have gone out and acquired an existing firm, Walker points out.

Therefore, Walker has had to dig and scrape for every inch. He is hopeful that someday the new group might have "a critical mass of business big enough to attract management's attention, and maybe they'll think about spinning us off as a subsidiary." Until then, the new business either stays small and makes enough profit to offset some DP costs, or Caterpillar will pull the plug on it entirely. "We are in what I call an 'internal incubator system' within Caterpillar," Walker says. "It's way too early to call. We're looking at a minimum of two years before we could even be considered as a subsidiary."

Walker does not have much time to ponder the future, however. He spends 80% of his time on the road as the sole marketing agent for his project. Walker stresses that his group is too small and inexperienced to respond to major request for proposals and act as a prime contractor. He wants to work as a subcontractor for such data service giants as Boeing Computer Services Co., General Electric Information Services Co., Martin Marietta Data Systems, McDonnell Douglas Automation Co. as well as government and military outlets.

"We feel we can be price competitive and provide a new lower cost alternative for massive amounts of high-quality business applications programming throughout the country," Walker states. The business includes other basic services such as coding, unit testing, debugging, program conversion and software development.

Though his newly trained programmers are novices, Walker instituted a volunteer program within the DP department that guarantees a high level of experience involved in every outside contract. Internal Caterpillar DP staff members volunteer to work a maximum of eight to 12 hours per week with the trainees to teach, answer questions and "assure the quality and timeliness of the project." The more complex the job, the more experienced the internal staff member who gets involved.

All outside work is done on second and third shifts so as not to interfere with internal Caterpillar needs. Walker is extremely sensitive to even the slightest hint that the new business will detrimentally affect the quality and timeliness of Caterpillar's own services.

"I walked a tightrope on that," Walker admits. "I have told all the people who volunteer and work with us that this is the No. 1 comment that must never be made. No one can use this as an excuse for missing an internal project date. That would probably get me shot down faster than anything."

Thus far, Walker has three external customers in the fold and more than 50 retrained data processors in his pool. The new venture is creating revenue not only from training the unemployed workers but from selling services that Caterpillar's huge IBM-based shop can offer.

Caterpillar operates a worldwide IBM Systems Network Architecture network with 450 high-speed lines coming into its East Peoria building. In addition to its expertise in teleprocessing, Caterpillar has developed several software packages to sell on the open market. Among them are an application development program, an on-line documentation package and a complex system for machine tool and equipment maintenance scheduling. Caterpillar is also actively selling itself as a hot-site backup for companies seeking security in case of power failure in their own data centers.

As Walker tirelessly pursues new customers, he admits that the entire project has been "a tough sell" to management. "I've still got my feet to the fire," he says. "There are a lot of people watching to see if we're going to interfere with our internal service, if we are really going to make any money, and if all this is worth it."

Whether or not the venture succeeds, the project has already reaped a significant reward. For the internal DP staff, it has been a tremendous morale booster.

"The internal Caterpillar DP staff looks at this with enthusiasm and support and likes the idea of getting a new business off the ground. We know if the business takes off, it will create some new career paths and new job opportunities for our people. Everybody likes that," Walker says.

— Glenn Rifkin

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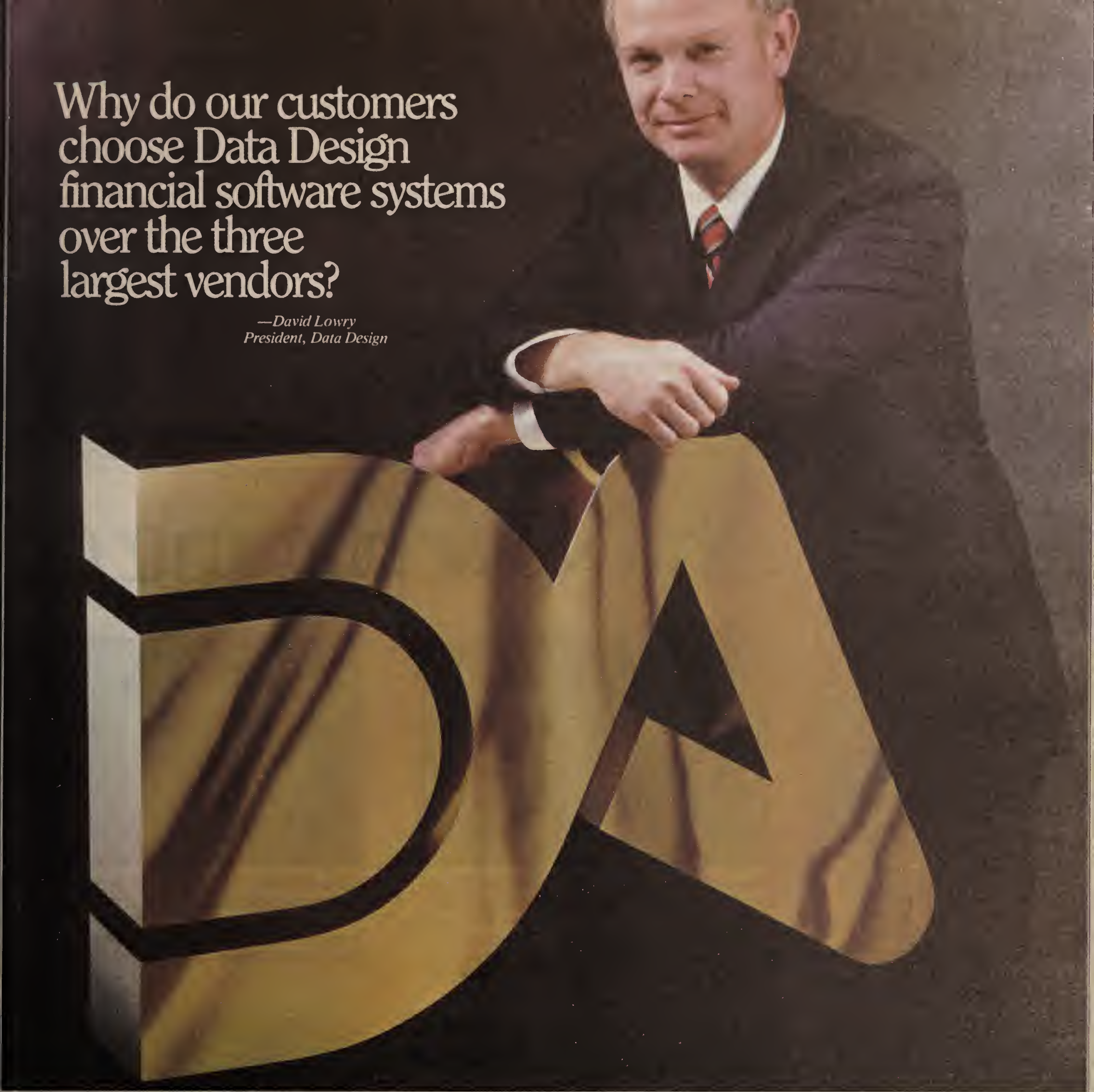

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Business School, adds, You've got this operation that you've been running for a long time, and suddenly the person you've got in charge of it has to start thinking in a totally different way. Instead of thinking in terms of cost efficiency, he has to think about competitive strategies. It's hard to estimate the cultural, metaphysical and philosophical transformation that takes place. The mentality of the MIS executive just hasn't been to think that way."

Some organizations that have tried selling outside are backing off, says Thomas Davenport, senior associate at Index Systems, "because it tends to lead to an arm's-length contractual relationship with users on the inside. If you are going to sell your services or products outside the company, you really can't give an inside customer a better deal than someone on the outside.

"I see a real reluctance by corporations to get into selling outside simply because systems are becoming more important as business grows, and you want to have them available and subservient to you when you need them."

☐ ☐

Opportunities for success despite the drawbacks

Despite the drawbacks, a number of data centers have successfully spun off into new businesses. Not all DP executives are content to remain a corporate utility. They can spot trends in their particular industry that require an information service or product that they can provide.

Success comes in various forms. The large profit centers are usually founded on long-term commitments from parent companies. Others get into the business through acquisition of independent data service businesses such as MTech, a subsidiary of MCorp in Dallas, or Electronic Data Systems Corp., a subsidiary of General Motors Corp.

For smaller organizations, the opportunities for success are more limited but, according to Rowan of Boeing, still ample. "In specialized industries, there is still room for new business for such things as applications and support," Rowan says.

And despite the difficulty, there are strong incentives to make the attempt. Obviously, successful external data center sales can add significantly to the bottom line and defray mounting DP costs. But there are other benefits as well. Primary among them is the morale boost such a venture brings.

"Your typical programmer and system analyst get frustrated after a while because of lack of advancement," Arthur D. Little's Withington says. "There's a ceiling to how far they can go. But if they are part of a new venture, they can grow with the profits; there's no ceiling anymore. They could even have stock in the new business. It's a definite personnel motivation."

The creation of a profit center also opens new career paths for DP executives and personnel. Showing the entrepreneurial spirit it takes to run a new business can lead to promotion from DP into the corporate mainstream. "Going from a cost center to a profit center can mean switching from a staff position to a line position. It can help careers dynamically," Ulrich says.

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> ***'I see a real reluctance by corporations to get into selling outside simply because systems are becoming more important and you want to have them available when you need them.'***
>
> — Thomas Davenport
> Index Systems, Inc.

As computers and communications come together, there is also great potential in selling network and communications services. "A lot of big corporations are building complex communications networks," Withington says. "They are trouble to build and manage. It involves a lot of cost, and there is generally excess capacity. So I foresee a new force entering this marketplace — from a large, widespread corporate network to an office automation service network — these integrated networks represent a temptation for companies to go out and serve outsiders."

In order to have a chance for success, the DP/MIS manager must understand the business ramifications of what he is getting into. Independent consultants or members of the business and marketing side of the organization should be brought in early on for advice (see story page 62). Enthusiastic DP executives can easily overestimate the capabilities of the internal department. "Most companies haven't been successful enough on the inside to justify going outside," says Brandt Allen, chairman of the accounting and information systems department at the University of Virginia.

The first priority for the DP/MIS manager is to determine if there is a sustainable, critical mass audience for the product or service to be sold. Ulrich recounts stories in which DP organizations had products to sell but failed because of lack of planning. "One company developed a

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>
> — Ted Withington
> Arthur D. Little, Inc.

leading warehousing package, and other companies expressed an interest," Ulrich recalls. "But the company that developed the product didn't understand marketing at all, and they still haven't sold it. Many companies simply don't understand how different other companies in the same industry really are."

Though a subsidiary arrangement is not mandatory, some clear spin-off business is essential, analysts agree. What is done in-house will almost surely be inappropriate for out-of-house sales, and a company must be ready to invest money, attract new staff and give the project the time it needs to flourish.

"The mistakes and failures have generally come from managements who assume somehow that a single staff will be good at both in-house and out-of-house assignments. It is never true," Withington says.

Withington points out that without the aura of a new, separate business, there is little possibility of attracting the right people as both employees and customers. And, in addition, if the outside business is not singled out, DP employees have no incentive to provide good service to outside customers.

"If the venture is all one organization reporting to an inside line manager, people will be praised most for serving the in-house users. The outside is only a number, a strange appendage that brings no special reward," Withington says.

Marketing becomes the key ingredient once a new business is deemed worthwhile. Robert Heckman, executive vice-president of marketing for MTech, says that two crucial aspects of marketing are going in and getting the initial relationship and building the product line. In the financial services industry, which MTech serves, it is difficult for a banker or DP professional to sell outside when the competition usually comes from high-powered vendors such as IBM. "Those guys are used to selling hard at the top of an organization," Heckman says.

Despite this difficulty, the banking and financial services industry provides the most success stories (see interview page 58).

Mellon Bank Corp. in Pittsburgh has sold DP services for 25 years — longer, they claim, then anyone else. At first, Mellon Bank simply sold excess capacity on its mainframe. By the mid-1970s, the bank saw a greater business opportunity and opened its Data Center Division, a profit center for selling DP services.

Though it is not a stand-alone subsidiary, the Data Center Division fields its own sales force and runs its own financial operations. According to Kerry Ryan, senior vice-president and manager of the Data Center Division, his group works as a business agent for the bank's central data processing department. They offer a barrage of banking services to 250 clients in 25 states. Annual revenue is $55 million.

In an unusual twist on the profit center theme, Mellon Bank has spun off additional profit centers for such disciplines as cash management services and network services. Ryan denies that the service business is saturated. Just the opposite is true in banking, he insists. "Most of the major banks are not offering the services we offer anymore. They can't make it profitable, and over the past 10 years, most have elected to get out," Ryan says. "Our biggest competitor is IBM. If they sell a computer to a bank so it can handle DP itself, we lose business."

Ryan points out that both the Mellon Bank and its 250 DP customers benefit by leveraging off of Mellon's expertise and cost efficiency. Though he will not reveal figures, Ryan says that the Data Center Division is "highly profitable." The keys to success are the ability to offer leading-edge technology from Mellon Bank's data center, the chance to be an independent division and master of its own destiny and to be big enough to leverage costs. "This business is so damn expensive that you've got to be a certain size or you won't make it," Ryan says.

A plethora of small banks hope Ryan is wrong about that. In 1977, The First National Bank of Fremont in Indiana went looking for an all-purpose banking system and ended up in the computer business. Finding nothing to suit its needs, the bank turned to its own internal DP staff to develop the necessary programs and systems. The staff created innovative systems using internally developed application programs running on IBM System/36s.

According to Don Talkington, national marketing manager for First National of Fremont, other local banks noticed what the DP staff had created and requested similar

Continued on page 63

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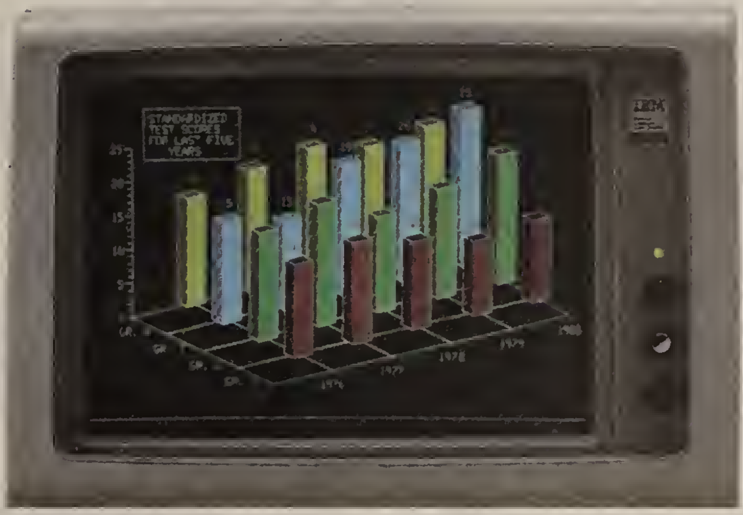

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INFOTRON SYSTEMS

Interview

John Singleton: He makes profit out of DP

Security Pacific Corp., the giant bank holding company with assets of $50 billion, spun off its data processing department in September 1984. The Automated Data Processing group changed its name to Security Pacific Automation Co. (SPAC), and DP's mandate changed as well — now it was to generate profit.

President John Singleton sees himself as an entrepreneur running SPAC, applying his data processing knowledge and resources to generate new deals, new profits and new ways of serving users.

Among SPAC's services are personal computer training for large corporations, value-added network management (through the Security Pacific Data Transmission Corp.) and turnkey banking systems. Security Pacific processes approximately five million items per night, both checks and paper, and an estimated 19 million electronic transactions per month. The DP spin-off grossed $325 million in revenue for 1985, $14 million of it from external business. Pretax profit was $1.8 million on the external operations, which includes the benefits of equipment sale and tax refunds. "Real profits" are forecast for 1986.

Singleton, a tireless proponent of the DP executive as businessman, was interviewed by Computerworld *Features Director George Harrar.*

Why did creating a subsidiary out of data processing make sense?

We watched a 28% compounded expense rate on a $300 million budget disappear in a little more than two years. If inside we could charge out 100% of our services and bring costs down and raise quality up to 90%, why couldn't we do that in the outside market? And why couldn't it be a major income-producing area for the corporation, like commercial loans, international loans and retail banking?

You were charging back internally prior to selling services externally?

Yes. Everything we did had to be priced, negotiated with and accepted by the user — plus, judged "average," "above average" or "outstanding" — that's our service level agreement with the user.

There are 427 service level agreements covering all kinds of products throughout the corporation. The one on automated teller machines could be eight or nine questions — we define prime time, secondary time, response time, what information is available. These are not technical standards. We say to a user, "What is your customer interested in? What hurts your customer in terms of dollars or the way you do business? How can we measure that to prove we are doing a good job?"

Some people charge out their services, but they don't say to the user, "If you don't like it, you can go outside." They also don't say to the user, "You get to measure us any way you want." That is really turning the screws in.

Did you lose executives at the point where you started selling services outside — people who had been in data processing for 20 or 30 years and said, "I'm comfortable with DP as a support service. I don't know about this entrepreneurial spirit that you're talking about."

No, but you hit a key question. We changed the culture of the organization dramatically. We said to our people, "You don't sit here anymore and move along at the speed that a lot of banks move at. You're going to run this like an entrepreneur."

Right now about 95% of your annual revenue comes from business inside Security Pacific. What will the change be in the next two or three years?

Our first reaction was to go out and be a profit generator on the outside. What happened since then was a major change in corporate thinking.

It was decided in July of 1985 that most of the other DP functions scattered throughout the user areas would be brought into the Automation Company. That amounted to about 600 or 700 people and $20 million to $25 million worth of budgets. The president and chairman of the corporation felt they could be managed at a lower expense level and with a better career path for the people.

John Singleton

'Don't say, "I'm from DP." Say, "I'm a businessman here to help solve your problems and I happen to have some DP tricks."'

You centralized data processing.

Yes, that's why I say we're unusual. We centralized control and decentralized the capabilty. We'll put the capability in Frankfurt or London or Tokyo, but SPAC as an organization controls it and manages it. That's different than what you see happening in the industry.

Did you agree 100% with that decision made by your chairman?

Yes I did. We felt we could do things cheaper and avoid duplicating systems by centralizing. We picked up all of the DP capability for the bank's financial subsidiaries, which make more than $100 million net profit a year.

Management also said that technology is a glue to hold the corporation together. It is the driving force that allows us to get our products to the marketplace. We cannot have it be a staff area. It really has to be a line organization, and it has to be equal to the other three cornerstones of the corporation — the commercial banking, the retail group and the nonbank financial subsidiary. We became the fourth line of business in 1985, equal to the other three in responsibility and input.

PROFILE

SECURITY PACIFIC AUTOMATION CO.

Corporate Headquarters: Los Angeles
President: John Singleton
Number of Employees: 3,933
1985 Gross Revenue: $325.4 million
External: $14.1 million
Internal: $311.3 million
1985 Profits: $1.8 million (external)

Security Pacific is no longer a bank, it is a multifaceted financial services company. Our chairman said that with this new philosophy, the automation company had to support the corporation now. If you don't deliver products and services, a major part of the corporation will fail.

First you were told to look outside for business opportunities, and then within a year, you were told to support inside users as first priority.

What they really said is do both, but don't minimize the inside support. Realize that the cultural change that is going on inside is so significant, if you don't move with it, you will lose those users inside. They will have to buy from somebody else if you can't deliver.

Were you overemphasizing selling outside?

I think there is a typical excitement where you say, "We are going to go out and buy a big company, and we are going to go outside and make $25 million in five years." If you are not careful, everybody directs their attention to the glamour of outside acquisitions and mergers. I have always felt that you keep the basic business you are doing and grow on that.

We have also leveraged ourselves through partnerships, joint efforts and cooperative efforts with major vendors. If we look at a new system in the merchant or retail banking area, instead of just putting 50 people on to build it, we go to a major software vendor or hardware vendor and say, "Look, we think that not only do we need this product built, we think the marketplace does, too. Tell you what we're going to do. We will put up X number of people, you will put up X number of people and test equipment, and we will build this system together, and then we can jointly market it, or we can work out who should market it and who should support it."

What companies have you done this with?

We are talking to Tandem Computers, Inc. — we haven't signed a final deal, but that is a serious discussion. We have done some work with IBM in automating the loan officer function. We are about to finish the production software there. We finished a joint effort with IBM to build an IMS data base for ATMs that will handle 100 transactions a second. We are attempting to sell that package in the marketplace.

A hundred transactions per second is quite a lot.

The average is about 30. The major banks are now starting to load up their ATM systems, and one of their problems is queuing. We think we can sell that package for about $1 million or more to major banks.

What are the opportunities for a bank in marketing information services?

We are regulated in many things. We can't sell a computer-aided design and manufacturing system to Ford Motor Co. We can't sell a system where the hardware represents over 30% of the value of the deal by banking regulations. It would be foolish for us to get into CAD/CAM. We are so far behind, we wouldn't be competitive. But in data bases, on-line systems, major packages — we have the capability to do things that a lot of people don't have.

And not just in banking.

Not just in banking. We are going to nonbanks and showing them how to handle their problems with personal computers. The on-line systems knowledge that we have is similar to the airlines'. We are on the periphery of the retail business — the point of sale. There is no reason why we couldn't go further with joint ventures in the retail business. To my knowledge, we are the only financial company that has a telecommunications corporation.

I addressed MCI Communications Corp.'s top management and said, "You don't want to be in the data center business. You want to be in the telecommunications business." We've offered to provide short-term computing resources to aid in their transition to a full distributed

See Singleton page 64

I Chose A Used 3083 Instead Of A 4381-3 To Improve On-Line Response Time And Keep My CPU Growth Options Totally Flexible

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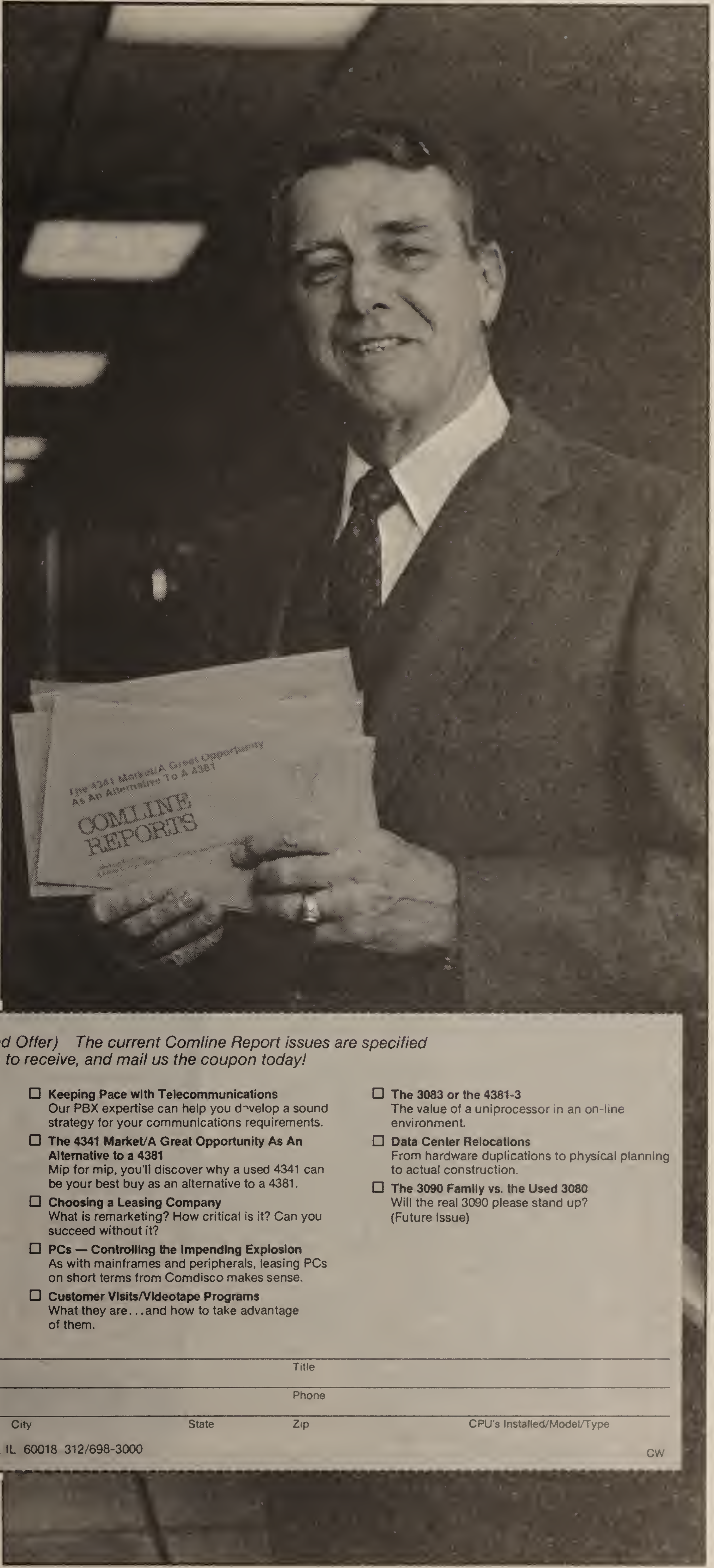
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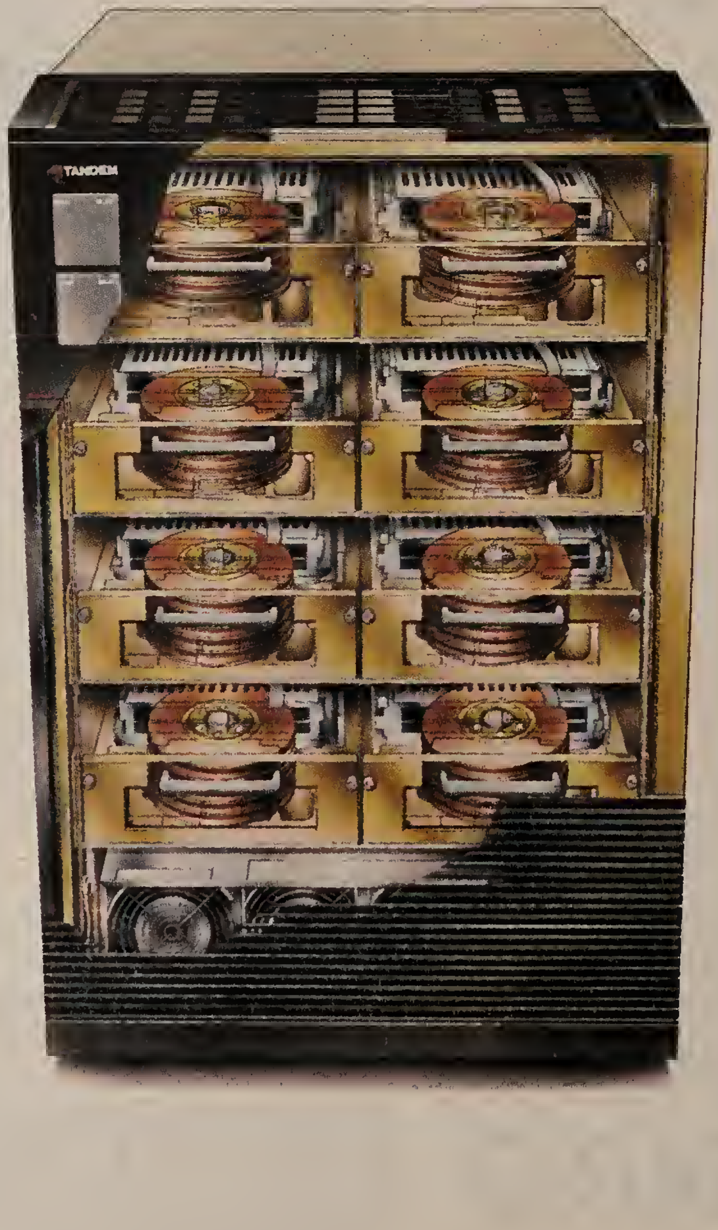

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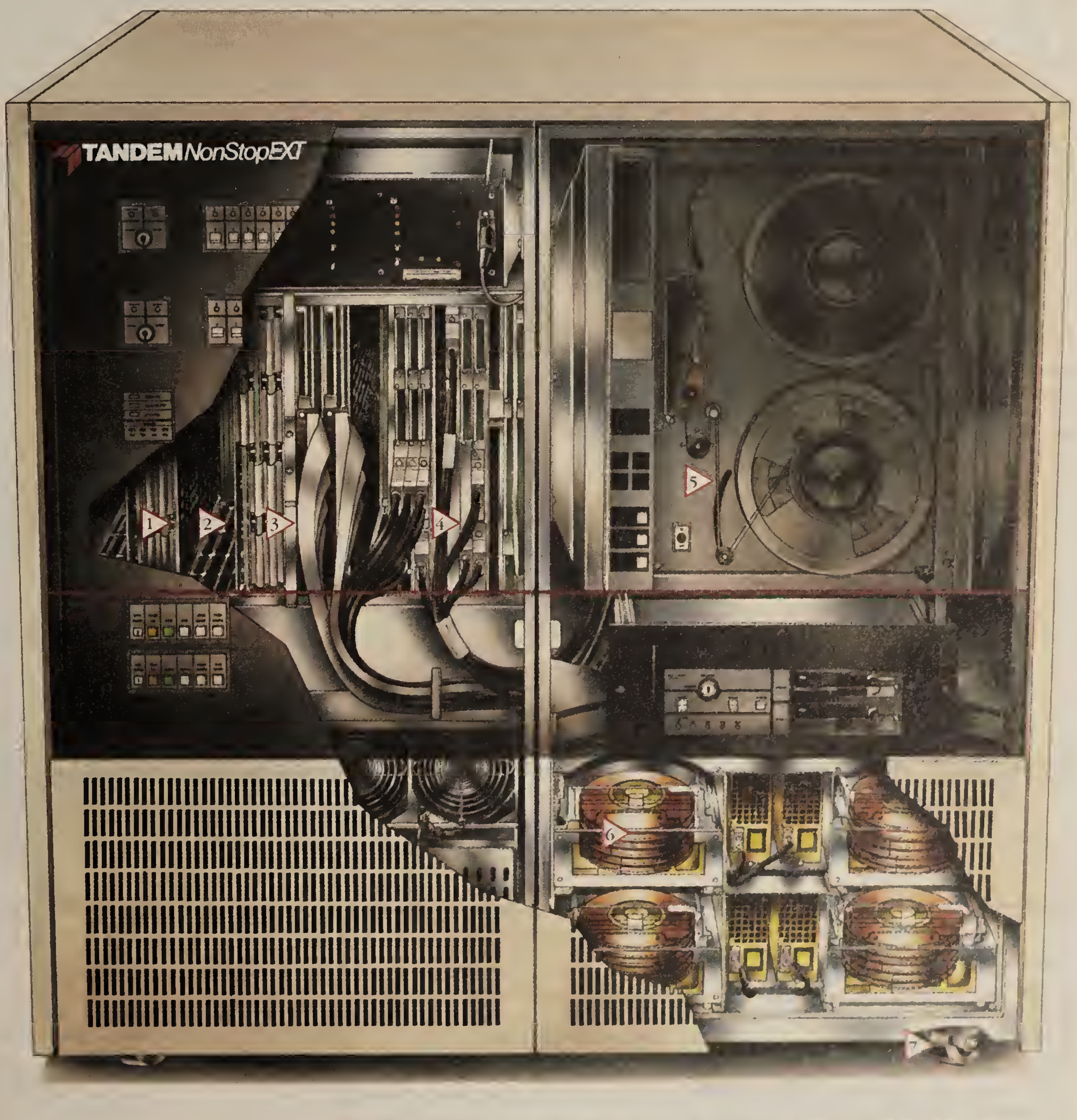

TANDEMCOMPUTERS

Can you deliver the profit your chief executive demands?

By LES GILLIAM

Must the data center be only a cost center or can it add directly to the bottom line?

The question seems to come up most often when business is slow and profits are down. The chief executive officer is looking for ways to generate additional income. He remembers all the money spent on data processing in the last few years and thinks that surely there must be a market for some of the products or services developed by his computer group.

With business lagging, there should be spare capacity available. The advanced software package that improved the company's productivity so much could be a money-maker. And selling products and services outside would keep the staff busy until business picks up again.

So the CEO calls you in. How will you respond? The best way to prepare is to answer beforehand the following questions:

- Is there a market for some product or service developed in your data center?
- What is the potential income?
- How will it affect services to your in-house users?
- What is involved in attracting and serving outside clients?
- What are the factors to consider in going into the software or service bureau business?
- What information is needed to develop a business plan?

Product or service offered. One of the first areas to consider for selling to the outside is usually spare capacity on the mainframe. A few years ago, spare capacity was available during the night shift or weekends to do batch processing for others. In today's on-line world, the capacity must be available during prime time.

The processing service offered may be simply computer time, where the clients provide their own application software. However, you are more likely to find a market if you are offering the use of a unique or advanced application package. Possibly the most popular approach to attracting outside income is to lease or sell a software package for others to run on their own computer.

The market. So now you have decided which products or services might have a marketable value, but is there a market? If management is seriously interested in starting a new business venture, instead of just making a quick buck, then a market survey is in order.

This survey should identify the initial prospects and provide the facts needed to gauge the probability of selling to them. Not only do you need general business information, such as revenue and income, number of employees, business locations and so on, but also information regarding the data processing product or service they are using that you hope to replace. The survey should also consider carefully potential competition in the marketplace.

Investment. The degree of investment required may not be obvious. Even to prepare, market and support a product or service that is already available will carry a cost. Using current staff for the new venture will make them unavailable for inhouse needs; therefore, it is a cost. Preparation of marketing materials, advertisement and selling expenses are all part of the required investment.

Potential return. The next step is to focus on the potential return on your investment, which involves estimating the revenue and expenses to calculate the profit. These estimates will result from setting the sales goals. With information about prospects and competition in hand from the marketing survey, you can set a range of sales goals, expected revenue and required expenses. Being conservative here is wise.

In-house impact. If the potential return on investment is still attractive, then you should determine and document the impact of the new outside business on your in-house users. Are they going to have to compete for resources with outside clients? Will it interfere with your responsiveness to their needs? Will they receive equal or lower priority compared with outsiders? This factor may very well be the most important for your boss to consider.

Staffing. A mistake often made is to try to start a venture without proper staffing. It is tempting just to add the new duties to those of the existing staff. However, their time, attention and interest are automatically divided, and it will diminish their effectiveness in both areas. Full-time employees are much preferred, and maybe required, if success is to be achieved.

Contract. The contract will set out the terms and conditions of the business relationship between two firms. Though an attorney will prepare the specific wording, you must participate in setting rates and defining the exact product or service to be provided. The area that is most often the source of later dispute involves what support services will be provided and whether they are free or billable.

The business plan. All the information gathered thus far should be summarized into a business plan. This document should include a description of the product or service to be offered, the market and competition and, of course, all the financial data regarding the investment, expected revenue and expenses and the estimated income. The possible impact on in-house users should also be clearly discussed.

Commitment. Offering data processing products and services for sale outside the company should be approached in the same way as any other new extension of the company's business. It must be integrated into the management functions of planning, organizing, leading and controlling. It must be compatible with and a reflection of the desired company image.

It must not be viewed as a way to make a quick buck but, rather, as a potentially profitable venture requiring the commitment of top management to provide the resources and time required to develop it. ■

Gilliam is an independent computer and management consultant based in Ponca City, Okla. He is a regular contributor to Computerworld.

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Continued from page 55

systems for their banks. Suddenly First National, a small financial institution with $65 million in assets, found itself becoming a value-added reseller for IBM, marketing its own software packages with IBM hardware.

To keep its new venture under control, First National limited itself to 10 installations per year. Most of its work involved installing computers into banks that had been using service bureaus. The bank plans to open two branch offices for computer services this year, Talkington says, with each office handling up to 10 more clients.

At the Frontier Federal Savings and Loan Association in Ponca City, Okla., an outside consultant told the chairman in 1984 that Frontier, the state's third largest bank, had a highly rated DP system in place and that costs could be reduced by selling its services outside.

Clyde Tew, senior vice-president and director of information systems, was given the mandate to set up his data center as a service bureau for other banks. The bank started modestly last year. "Our goal is to help the bottom line," Tew says. "We are not going to add staff until we have enough customers to justify it."

Tew's department offers other financial institutions a multitude of banking and office services. He is looking to expand his base within Oklahoma before seeking customers out of state.

Currently, the bank plans to keep Tew's new business as part of the in-house data center. Whether or not it is spun off into a subsidiary will depend on how quickly it grows and the revenue it generates. "The big question is whether we will be a spinoff or remain part of Frontier," Tew explains. "It has to be determined whether Frontier wants to give up control of these resources. Now they have 100% of our resources, and I'm not sure they realize what they'd lose if we had outside contractual obligations."

Tew would like to see Frontier either spin off the data center into a separate business "or get out altogether." He predicts that it will take up to five years to turn a profit at the current pace but that a profit could be realized in one year if the bank made a serious commitment and spun off the business as a subsidiary.

In order to succeed, Tew says that, at the very least, he must add staff. "You can't start a new business with no new staff. Having a good DP department is not enough." He has the approval to hire a marketing manager to take on the task he has handled alone thus far. His marketing campaign has been a direct mailing to a group of DP managers followed by phone calls. "We don't have a lot of money invested in marketing yet," he acknowledges.

His 14-member staff put in 250 man-weeks in 1985 to get the new venture off the ground and worked many 50- to 60-hour weeks. Though response to internal Frontier needs may have slowed a little, his staff was not resentful of the added burden. "We all own stock in the bank," Tew says. "What's good for the company is good for us."

Across many industries, the word on data processing is consolidation. While many Fortune 500 companies have consolidated all their DP activities into a central unit, others have looked externally, acquired a data services company and given it the DP responsibilities.

CCS Automation, Inc. was the computer and communications arm of Continental Airlines until the financially troubled carrier sold the spin-off to Texas Air Corp. It was turned into a completely independent company in January 1984. Already a service bureau and profit center, CCS serves more than 85 other airlines with reservations systems (in 1984 it handled 48 million boarded passengers), flight planning and a list of other traditional DP services.

According to James Goodlet, senior vice-president of DP and communications, CCS' success stems from its willingness to take on the expenses of being an independent organization. "An awful lot of companies don't want to live under the constraints of a profit center," he says. "A cost center is a nice, safe environment. A

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profit center brings with it a lot of additional overhead. Two other airlines have tried to do what we've done and found it too expensive. It depends a lot on your mission."

Founded in 1968, data service firm MTech became a subsidiary of MCorp in 1975. This connection to the huge Dallas financial corporation helped speed MTech's growth, which reached $165 million in 1985. MTech now provides DP services for MCorp and its 64 related banks along with 1,200 independent financial institutions in 19 states.

According to Heckman, MTech derives just 30% of its income from serving MCorp. It is not captive to the holding company even though it flows profits up to the parent organization. This independence is essential to landing key personnel as well as new customers.

Heckman wonders whether an in-house DP unit can survive trying to compete in the open market. Deregulation in banking has made the once-staid business a fast-paced product-oriented venture. "Just to keep up with new products and changes in the business is a full-time job in a large bank," Heckman explains. "Consequently, to go out and remarket those services is tough. You may be so busy laying the track for the railroad that you don't have time to do anything else."

Though top management clearly wants to cut DP costs and occasionally pushes for DP to become a profit center, the impetus for these ventures more often comes from DP itself. DP executives see a chance to get into the spotlight and realize that a successful foray into the outside world will draw attention to this heretofore backroom operation.

Top management, in fact, is more likely to hesitate on such an action. DP should continue to pursue its primary business goal. If management can be convinced to give it a try, DP faces a stern test, Ulrich says.

"There are some serious potential problems and internal conflicts that can affect both outside clients and internal projects," Ulrich says. "If you start robbing one resource to pay the other and internal needs are not being met, management will kill the whole thing." ■

Computerworld *Senior Editor James Connolly contributed to this report.*

Singleton continued from page 58

environment. I told them, "We are not going to buy networks. We don't build network machines, you do. We don't put fiber optics in, you do. Let's bring our strengths together in a relationship."

Is that your agreement?

We haven't signed it yet, but we put that deal on the table. We approach everything that way. Our philosophy is that we don't pay retail, and we don't do it ourselves. Rather than being the high-cost, high-overhead group, we go back to our internal users and say, "Look at this deal. Tandem will put up X number of people, pretest equipment, build this loan accounting package with us, and we can bring it to the marketplace months sooner with lower cost, sell it outside — and you can get a royalty." That is a sweetheart deal.

And Tandem gains your banking experience.

Not only that. They don't have the software to sell their hardware. That is their weakness. We are a big Tandem company. I told them, we have four pieces of software that use your equipment. If you had this one piece in the middle, you could sell it to banks, telephone companies, finance companies.

They would market it or you?

We could work it out. We could sell it, they could service it or vice versa.

You can work those deals out once you decide what you are going to do. We are not inflexible about who sells it and who services it. We could sell the rights to them and let them market it, and we'd get a royalty. We don't care. My goal is to cut the cost down inside.

An inside group can copy this style and never have to go outside. If you are Metropolitan Life or Aetna Life or Westinghouse or whoever it may be, why couldn't you run your DP the same way? What's to stop you? That is my whole point.

The data processing guy is sitting there fighting with the user, fighting distributed processing, losing on both counts and saying, the battle is over. I'm saying, "No, you are fighting with the wrong rules. You're going to lose under those rules. Step back and stop thinking about yourself as a technician first, and approach the internal user as a businessman and an entrepreneur. Don't say, 'I'm from DP.' Say, 'I'm a businessman here to help solve your problems, and I happen to have some DP tricks. Now, what kind of deal do you want? What are you trying to do?' Show them you have a business mind. Talk about earnings per share."

That means the DP manager has to know about banking, insurance, whatever field he is in.

That's the point. If they don't know, they are not going to be in business anyway because the other people outside are going to eat their lunch. They have hidden from that. They've said, "I don't need to know about the engine business or whatever, I just have to build systems." Baloney — if they don't learn something about that business, they

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won't know how to build the product. We are driving the data processor to become the business person.

The data processing person has to identify himself as a banker, an insurance agent.

Right. They have always said that their allegiance is to data processing. They've said, "I am a professional data processor, I'm not a banker. I'm not an insurance guy." I don't say I am a banker. I say I am a businessman working in a financial company. I am not a data processor.

One of my favorite cartoons is two vultures sitting in a tree. The title is "The ultimate entrepreneur." One vulture is saying to the other, "Wait, hell, let's go out and kill something." Underneath the one who said that, I wrote "proactive"; underneath the one who is listening I wrote "reactive."

We were proactive. We were the vulture that said, "Let's go outside and kill something, rather than sit here and watch everything be stripped from us."

The issue is not whether to sell outside or not. The issue is, What can the data processing guy do to survive? People are changing the rules, but he hasn't changed his ability to work within the new rules. The culture changed on him, and he is not changing quickly enough.

Our view is one approach that works just as well inside or outside. We found that when we took service level agreements outside and started talking about guaranteeing performance, users said, "You're what? Nobody guarantees performance." Well, we guarantee $275 million worth of performance inside, we certainly can guarantee $25 million outside.

Now, if we are at the excellent level, you need to talk to us about paying more. If we are below average, we need to talk to you about rebates. It works both ways. Some are not willing to do that. Others say, "That's interesting. Let's keep the discussion going."

Your message to DP managers is that you can't do business as usual?

That means you have to understand how to leverage your resources. One of the ways, regardless of your size, is to find the key people you are working with right now — software companies, package companies, OEMs. Sit down and say, "Here's what I want to do in the next year and five years; here's what I'm willing to do to help develop a product or service with you for my company as well as take it outside."

We had $7 million dollars for telecommunication in our budget. Now we have $66 million. We went to all the users and said, "AT&T and Northern Telecom, Inc. will not talk to us for $7 million. They don't even hear us. For $50 million a year, they're all ears."

We had tremendous attention on the private branch exchange decision we made for $25 million, which we gave to Northern Telecom. We pulled all the money together, all the credit card authorization, all the wire transfer, everything we could strip out of the user budget, and we got the corporation to put it in one place. We gave it a corporate identity — the Data Transmission Corp.

> **"**
>
> *'One of my favorite cartoons is two vultures sitting in a tree. The title is "The ultimate entrepreneur." One vulture is saying to the other, "Wait, hell, let's go out and kill something." '*

We said to Northern Telecom, "In our smaller branches we can't afford a $15,000 PBX. We need this kind of PBX in this price range." They said, "We think we can do this for you and build something other people your size will want to buy." That's the way we leveraged it.

Don't think you have to be a $200 million dollar company to find somebody. I did it when I was with a $12 million company, the Maryland National Bank. When I came to Security, I was aghast to find they weren't doing it here. I said, "How can I be doing it in a $12 million company, you folks have a $200 million dollar budget, and you are not leveraging it?"

I said my first day here, "We'll never buy retail again." IBM went crazy. We literally had the account executive escorted off our account. I told him I would not deal with him anymore. He said, "competitive bids, joint ventures — IBM doesn't deal that way." I said, "I'll get somebody who will. You either start working some entrepreneurial deals with me, or I'm not dealing with you."

The DP executive has to take charge?

He has a fighting chance. But he must be willing to really do some introspection and say, "Environments change. Am I willing to change? The culture has changed. Am I willing to adapt to it? If I can, it can be exciting again and fun again."

We can't talk in millions of instructions per second anymore, we have to talk earnings per share. Among ourselves, we'll talk about

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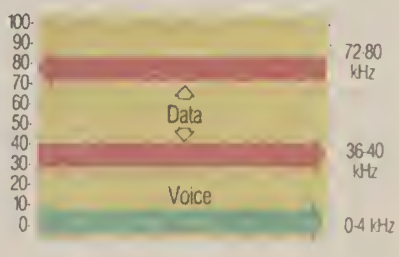

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MIPS, but with the user we're going to talk about earnings per share. We're going to switch our vocabulary when we enter his office.

We had a meeting with our users where our head of the computer center talked about taking the Ds and making a K, and taking the Ks and making a Q. I chewed the daylights out of him. I said, "Let me tell you how you should have said it — 'We're getting rid of three old computers and buying two big, fast computers, and we're going to write them off over five years because we're getting them at the beginning of the development cycle.' Period. That's the speech. Put it in the King's English — 'They're old computers that run old software that don't work in today's environment.' Stop worrying about your pride — that you know all of the transfer rates. Users don't care about transfer rates. Back among ourselves we talk about all these things."

I can't drag my Cobol program solution over and say to the user, "In two years I'll write you this program." I have to say to the user, "I'll write you a Cobol program — or no, that won't work. Then I'll help you get a PC and you write it. Or I'll write the PC program, and you own the PC. I'll give you a mini. Or I'll keep the mini, and we'll write the software together. If I can't do any of those things, I'll go out and find somebody who can write software or has the package, and I'll negotiate the contract and manage it and make sure it works for you."

Is that transition to operating as a business person within the capability of most DP managers?

Yes. I didn't go back to graduate school to learn it. When I came here, we were going the old way. The users — all three vice-chairmen — came to my boss and said, "We're going to rip off pieces of your organization, take them, distribute them and manage them, because your costs, your delivery — they're not working. If we're going to have the aggravation, we might as well own the bodies and the thing ourselves."

I went around and said, "Wait a minute, you really don't want this. You don't want the headache. What you want is quality, on time and something that works." They said, "That's right, but we can't get it." I said, "Give me 90 days — not six months, not five years — give me 90 days to show you a perceptible change in cost and strategy. If I don't deliver it, do what you want."

In 90 days, we put the service level agreements in, we put unit costing in. I told our guys, "Don't change it, don't screw around, put in exactly what I'm telling you to do, and don't argue with me because you don't have time to do that. The culture has changed, and either we hit the road running or we're out of the ballgame. We're fighting for our careers now, and you cannot do it the old way, guys. From now on we joint venture, we partnership, and our reputation is that we don't pay retail for anything from anybody ever again."

Including IBM?

Including IBM. That's why we had to replace the account executive. He had 28 people working for him. He said, "I'm John Akers' personal friend, you can't remove me." I said, "You're not allowed in our building anymore. How are you going to sell to us if you can't come here anymore?"

When was that?

About two years.

He hasn't been back?

We have a new account executive. They kept the other guy there for six months, but he couldn't talk to our people, and he couldn't come in our building. Finally IBM agreed that this was ridiculous, and we had to get a new guy. So they got rid of him. They sent him to Japan. He came back, but not working for us. It shows you that the user is more powerful than the corporation.

DuWayne Peterson, your boss and chairman of SPAC, moved out of data processing into general business management. Is that happening to you, too?

If you look at our company — basically $300 million and 3,900 employees worldwide — we're the size now that you have to run it as an entrepreneur or business person; you can't run it as a technician or a data processor. We're constantly looking for mergers and acquisitions, anywhere from $2 million to $200 million. We have to be diligent on those projects just like a regular businessman would, not a technician.

Can someone with a data processing background be the chief executive officer of Security Pacific Corp.?

When you're equal, you can compete with the other guys in those jobs. Look at the other financial companies of the U.S., and see if DP has equal status with lending, retail banking and the nonbank subsidiaries — you'll find the answer is absolutely not. I think we're the only bank in the country where we're considered an equal.

So you're about one of eight people who might be considered for the top spot?

As you look down the road, there are seven or eight who are the top executive vice-presidents who could move up. DP isn't the easiest route. But all a bank does is move information, most of the time electronically. Who is the driving force in that? It isn't the bank lending officer, it's data processing. ■

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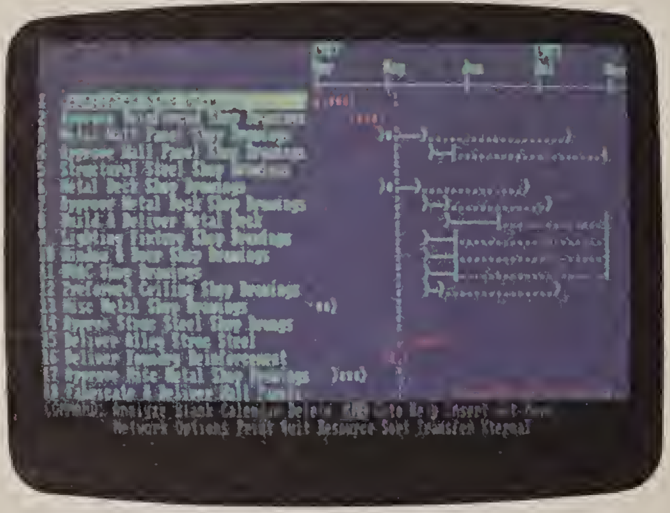

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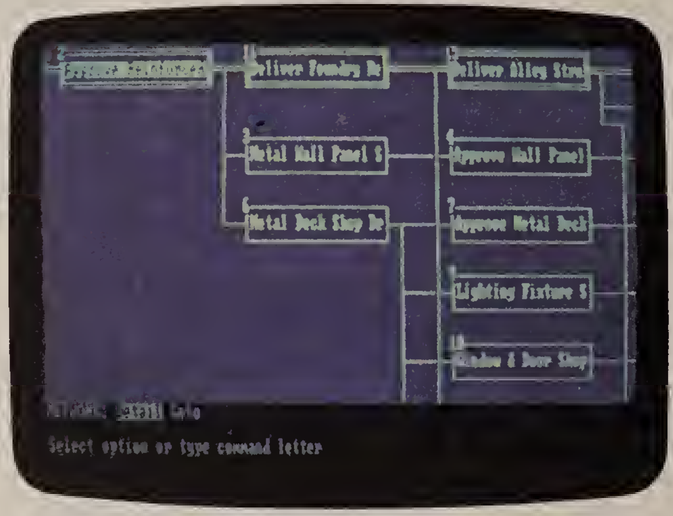

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In Depth

A scientific approach to human engineering

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Growing public awareness of ergonomics has fostered a view based on misinformation and myth. In ergonomics, clear objectives and commitment benefit end users as much as soft lighting and VDT safety.

By RICHARD KOFFLER

Er-go-nom-ics n: *an applied science concerned with the characteristics of people that need to be considered in designing and arranging things that they use in order that people and things will interact most effectively and safely — called also* human engineering.

Webster's Ninth New Collegiate Dictionary

Not too long ago, the word ergonomics was sure to elicit puzzled looks. Few people had heard of the word, and even fewer knew how to pronounce or spell it. Things are changing: Some information technology specialists today are starting to apply it to their systems, equipment and workplaces.

This upswing in awareness is not surprising. There has been ample press coverage dedicated to ergonomic issues and plenty of advertising space devoted to ergonomic equipment. Several states have even attempted to pass laws governing VDT design and the workplaces where VDTs are used. Unfortunately, though, the ergonomics of information technology remains an elusive concept for many.

The purpose of ergonomics is to design and build things to comply with human requirements, limitations and preferences rather than to expect people to adapt to a design. Ergonomics' objectives include increasing efficiency, decreasing training requirements, safeguarding health and safety and reducing psychological stressors such as frustration.

The ergonomics of information technology incorporates inputs from other disciplines such as psychology, biomechanics (the study of body motions), anthropometrics (the study of body measurements) and several engineering fields, such as computer science and mechanical and industrial engineering.

Information technology ergonomists are concerned with three main areas: systems and equipment, workplaces and psychosocial factors such as job design and training. These areas are so tightly interrelated that treating each factor independently may lead to an optimized solution for one set of objectives but may leave more important issues unaffected.

Determining quality

Ergonomics, like any other science, consists of a knowledge base and research methods; the quality of these elements is of prime importance. Understanding the difference between good and poor research is necessary because most of today's misinformation about ergonomics is based on invalid evidence. The quality of ergonomics research, as with all forms of scientific research, is determined by attributes such as experimental controls, statistical analysis and the interpretation of results.

Experimental controls are methods by which researchers try to ensure that they will measure what they want to measure. The absence of proper controls renders a study useless because it does not allow researchers to determine any existing cause-and-effect relationships.

Statistics are used to summarize and compare results or to determine if a result was found by chance. Using a study that does not have statistically significant results to support a position is inappropriate because the effects may not be real.

Even if a study has flawless controls and statistical analyses, it is still possible to draw the wrong conclusions. Here, one of the most important scientific adages is appropriate: "Correlation does not imply causation." In other words, just because two events are correlated does not mean that one causes the other.

Another aspect of interpretation has to do with generalizing the results of one study to the rest of the world. No single study can provide sufficient evidence to generalize to all other possible circumstances. In fact, most findings of ergonomics research are limited to actual participants in the study. Before results can be generalized, it is necessary to repeat the same study with other groups of people, in other organizations and under various conditions.

For example, several years ago, scientists at the University of Vienna investigated the possible effects of

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Koffler is president of the Koffler Group, Santa Monica, Calif.-based consultants on information technology and ergonomics. He will speak at the Office Automation Conference, March 23-26 in Houston.

VDT use on visual acuity. Participants in the study were asked to work with VDTs for up to four hours. This time frame was chosen arbitrarily, given the objectives and limitations of the experiment.

Some people who were not researchers, however, read the published report and determined that the scientists recommended VDT work be limited to four hours per day.

Soon thereafter, the following myth was born: "European laws limit VDT work to four hours per day." Nothing could be further from the truth.

Common sense vs. facts

Because most ergonomic solutions make sense after they succeed, people often mistake ergonomics for common sense.

Many poor decisions are made on the basis of commonsense, seat-of-the-pants, "it seems right to me" intuitive or speculative methods.

For all their virtues, these methods may not provide accurate information, a factor that can be very costly when dealing with major projects that affect many people. Assumptions and design solutions need to be evaluated objectively before major decisions are made.

An important issue to consider is the discrepancy that often arises between performance and preference. People are not always good judges of what is best for them, depending on whose definition of "best" is used.

For example, researchers in Europe tested several methods of controlling reflections — sometimes called glare — from VDT screens. They found that performance — speed and accuracy — was best with a simple etched glass screen, yet most people preferred a contrast-enhancing micromesh filter.

People may have liked the micromesh for purely subjective reasons, such as aesthetics or changing taste, while their performance would be a more stable, objective measure.

Ready-made answers

Another misconception about ergonomics relates to ready-made answers, sometimes called "quick fixes" or "Band-Aids." It would be very convenient if guidelines, formulas or standards for the most ergonomic design of information technology and workplaces were available.

The demand for ready-made information has become so strong that an entire office building — including computer systems and workplaces — could be designed ergonomically on the basis of available guidelines. But is this the right thing to do?

The answer is no. Just as it is impossible to answer the question "What is the best computer?" without additional information about applications and users, the ergonomics of workplaces, systems and equipment depends on several factors.

The three most important ergonomic factors are the following:

- ■ Tasks, including duration, degree of control, variety and training requirements.
- ■ Individual differences, including physical and psychological requirements, limitations and preferences.
- ■ Environmental conditions, such as lighting, climate, furniture arrangement and noise.

Satisfying one set of factors but not others may render a design "unergonomic." Additionally, what is ergonomic in one situation is not necessarily so in another.

For example, a chair may be perfectly adequate for one type of user, task and environment but inappropriate in other circumstances. A user-system interface that is ergonomic for one group of people performing a certain task may not be so for another group or even for the same group performing a different task.

The bottom line for the designer is caution. Although guidelines can often be a useful source of initial ideas, most — if not all — of the existing sets of guidelines suffer from severe shortcomings.

First and foremost, we currently lack sufficient information to create ready-made answers that can be applied in a wide range of situations.

Also, some vendors claim to deliver products and services that provide a fixed — and usually instantaneous — level of productivity improvement. These claims may be true under certain conditions, but differences in tasks and people do not allow generalizations from one

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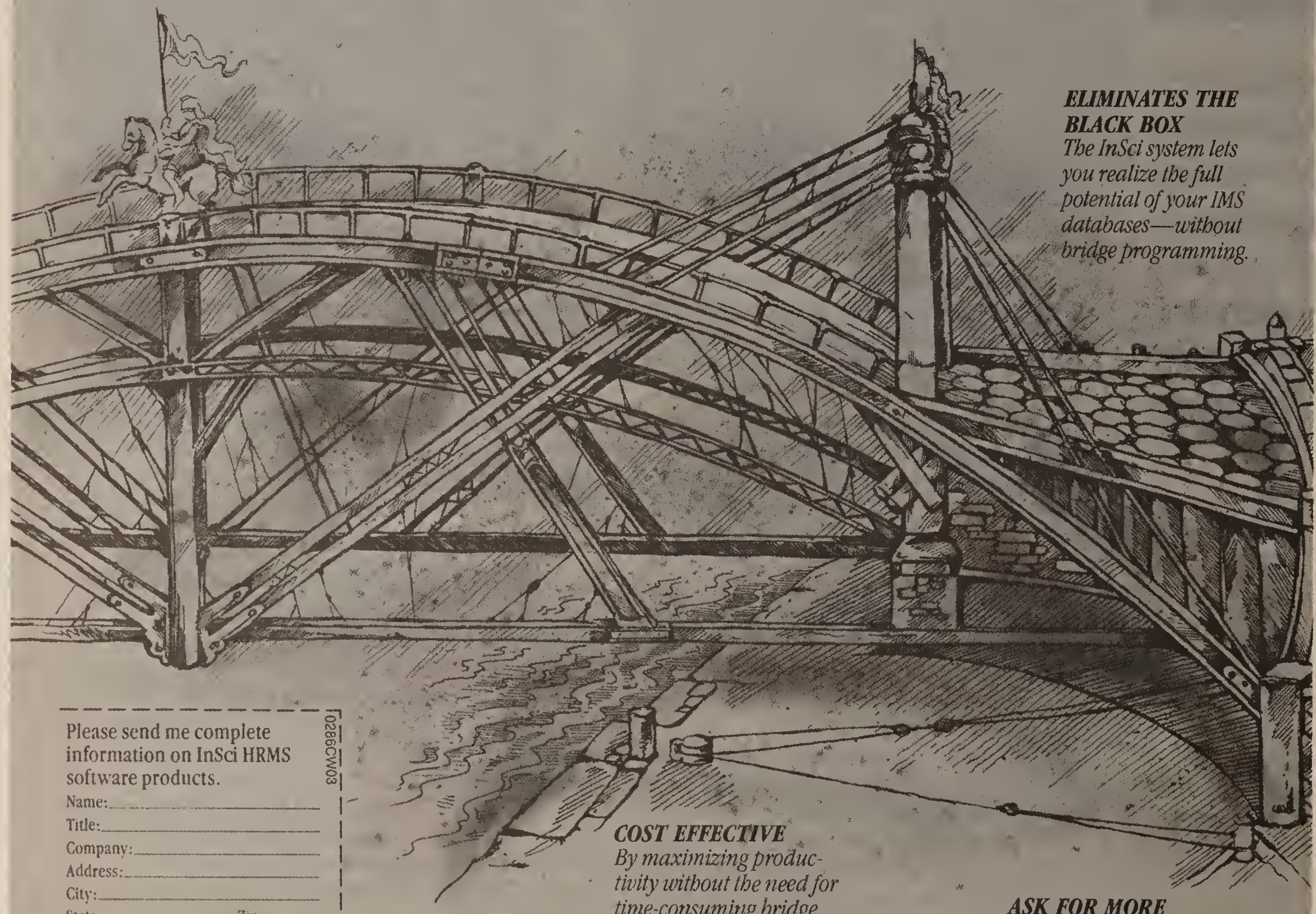

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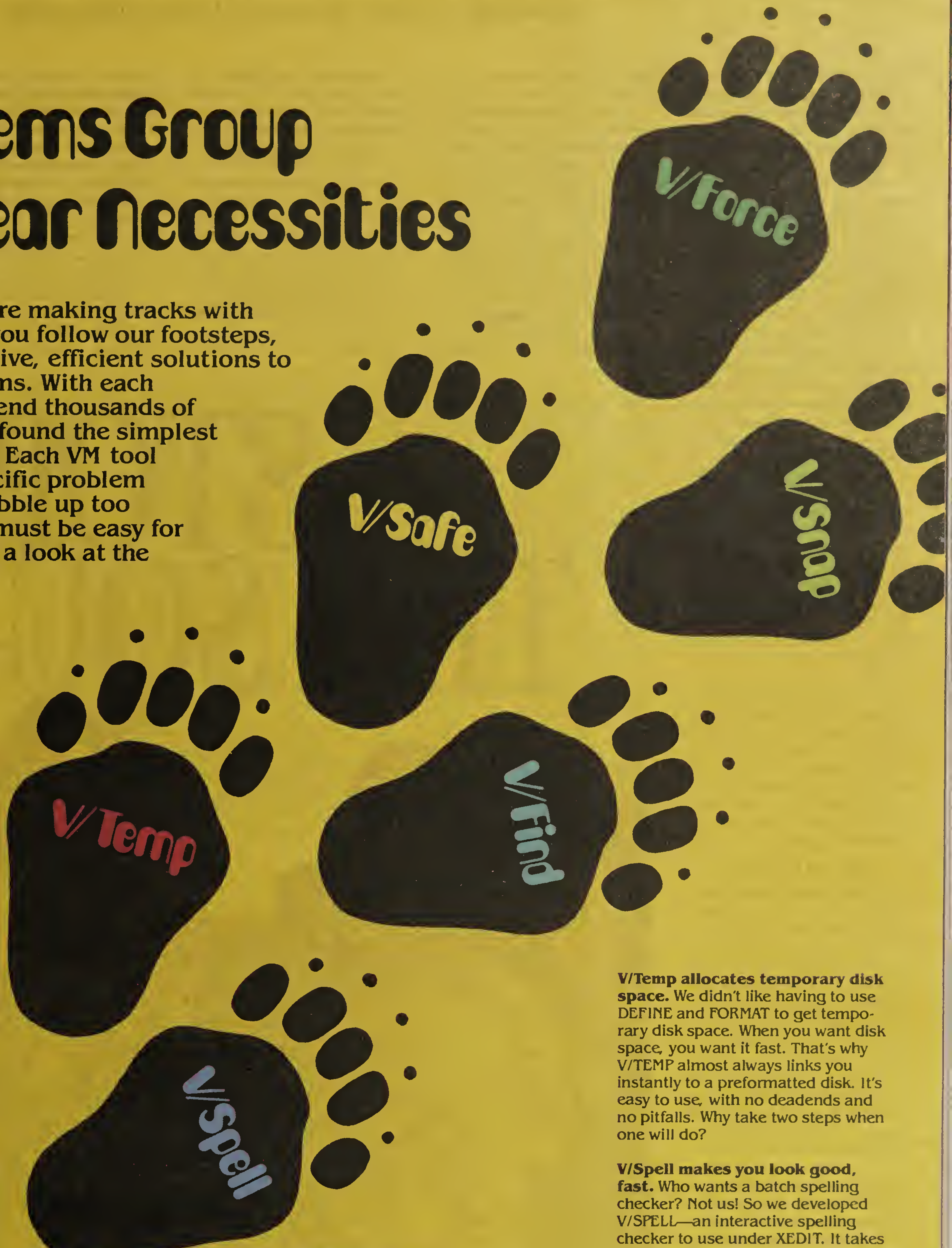

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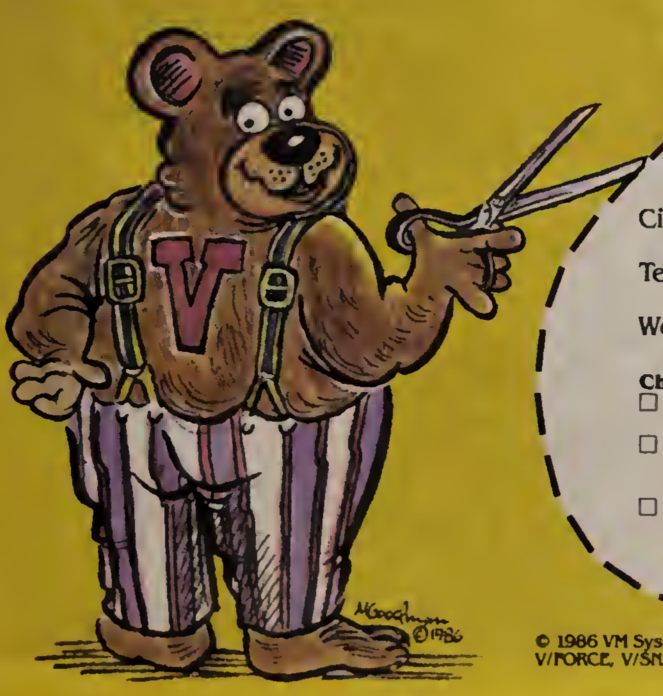

VM Systems Group
Solving the Hard VM Problems

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situation to another.

There is widely publicized concern about possible links between health problems and VDT use. Some of the permanent health problems attributed to VDT use are related to vision, pregnancy, joint and muscle diseases and even nervous disorders.

A peculiar aspect of this controversy is that the proponents of the argument that VDTs are health hazards often speak quite persuasively but base their ideas on mere speculation. Meanwhile, some of today's most reputable scientists still have not found any mechanisms by which VDTs might cause health problems.

Several years ago, a Spanish scientist claimed that under certain laboratory conditions the development of chicken embryos is affected by very low frequency pulsed magnetic fields. This finding led to speculation that human embryos and fetuses could be similarly affected if the mother used a VDT.

The chicken embryo experiments, however, were never replicated. Even if the effect were shown to be caused by the radiation, several prominent scientists have refuted the use of such results to predict possible harm to humans.

VDTs and pregnancy

Despite these facts, the VDT radiation controversy has not subsided because of reported pregnancy problems among groups of women working with VDTs. Yet all types of events, including pregnancy problems, are found to cluster from time to time.

As an analogy, take a map of the U.S. and a bucket of marbles. Pouring the marbles over the map will yield a distribution pattern that is far from even. What is least likely to happen is that every marble will fall exactly equidistant from its neighbors. Applying this analogy to the adverse pregnancy outcomes, pregnancy problems can be found in groups from time to time by chance.

The idea that VDT radiation causes cataracts was started by an ophthalmologist who reported instances of cataracts among VDT users. These could occur only if VDTs emitted sufficiently high levels of certain types of radiation, which they do not.

Later investigation showed that several of the cataract victims had been exposed to other known causes of cataracts. Researchers have not been able to find a higher prevalence of cataracts among VDT users compared to non-VDT users.

If VDTs were a threat to health, the problems could only be induced by high emission levels of radiation or chemical agents or by the nature of the work with VDTs.

Yet no one has measured potentially harmful levels of emissions from VDTs, nor have any permanent joint, muscle or psychological problems ever been positively linked to the use of VDTs.

X rays are always present in the environment because they are emitted by all physical objects. These background levels are so low, however, that they do not harm people over a lifetime of exposure. Laboratory tests show that VDTs do not emit X rays above these background levels.

VDT vs. non-VDT work

Visible light and ultraviolet and infrared radiation from VDTs also fall well below the levels found in the natural environment. Therefore, shields and lead aprons that are sold to protect against "VDT radiation" are useless.

If VDTs are health hazards but the unit itself is not the source of the hazard, the only other probable cause would be related to the nature of VDT work. Based on all available evidence, the most that can be said about VDTs is that using them may cause temporary visual and musculoskeletal discomfort to some people and only under certain conditions.

No long-term effects have ever been found that could be attributed exclusively to VDT use. In addition, disorders requiring medical treatment, such as a wrist problem known as carpal tunnel syndrome, are not unique to VDT users.

Several studies over the years have tried to establish the nature of temporary visual or musculoskeletal discomforts attributed to VDT use. Some studies, which were poorly conducted, concluded that people using VDTs suffered from higher incidences of these problems. Other, properly conducted

studies found the opposite. This does not imply that VDT users are not experiencing discomfort; it means simply that the users are experiencing the problems with the same frequency as non-VDT users performing similar jobs.

Although there is no intrinsic reason that VDTs should make a difference in the occurrence of these problems, many aspects of the work can change when VDTs are used. For example, temporary problems of this sort can be caused or aggravated by changing conditions, such as the following:

- The nature of the job — prolonged sessions with infrequent postural variations or relaxation from close-up visual work, monotonous tasks or insufficient rest breaks.
- Mismatches between the equipment, the workplace and the person, such as excessively high desks, very cold or very warm rooms or uncomfortable workstation layouts.
- Changes in viewing conditions, since VDT screens are usually read at a farther distance than paper, possibly causing discomfort for those in need of reading glasses. The VDT did not cause the visual anomaly, but its use made the need for reading glasses noticeable.

The concern for users should address the proper use of VDTs and not place blame on the VDT itself for physical or psychological maladies. Since the reported problems are also experienced by people who use VDTs infrequently and by those who do not use VDTs at all, the needs of these other workers should not be ignored.

The user-system interface

The ergonomic design of user-system interfaces should address all points at which end users interact with the system. Hardware and software are interdependent; for example, graphics designed for color monitors may not be presented adequately on monochrome screens.

Design issues include the interface language (commands, prompts, menus, graphics), Help and Error messages, screen layout, sequence of operations, allocation of functions to person and system, use of special keys, recovery procedures and documentation.

Although ergonomic hardware is not easy to design, it is achievable given the information available today. Designing ergonomic user-system interfaces that include software, however, is a different story.

Research in this area is so complicated that after years of trying, we are still relying mainly on design ideas. Even widely accepted goals such as "easy to use" and "short learning times" are difficult to define and measure.

This situation is not likely to improve drastically in the near future because we lack a sufficiently broad knowledge base to understand and apply systematic and proven design methods. There is even disagreement on how to define users, let alone how to find the best user-system interfaces to support them and their tasks.

Published sets of guidelines can serve as useful starting points, but they are not always useful in making design decisions.

Successful designs

But all is not lost. There are many user-system interfaces that successfully support the tasks and requirements of their users. Most are the result of strong commitments to proper design methods.

Successful design efforts begin with manageable and measurable objectives such as "The systems shall have X seconds of response time" and "Learning time for the target users will be less than Y days."

These objectives are more useful than commonly mentioned goals like "The system should be user-friendly" and "Remember the user!" Proper user-system interface design also requires complex analysis and multiple forms of usability testing.

VDT design. After years of study, the design of the "ultimate" ergonomic VDT remains elusive. As already noted, the ergonomics of anything is determined by the tasks, the users and the environment.

For instance, automatic teller machines have displays that are adequate for simple banking transactions. Those same screens, however, would be inappropriate for word processing tasks inside offices.

The following factors are

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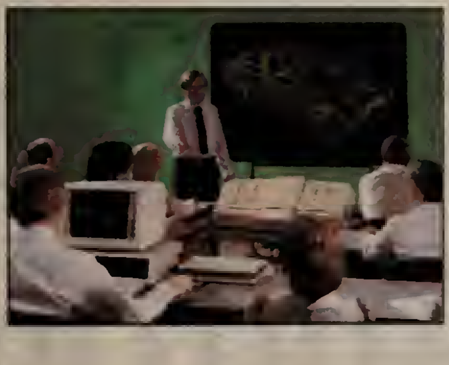

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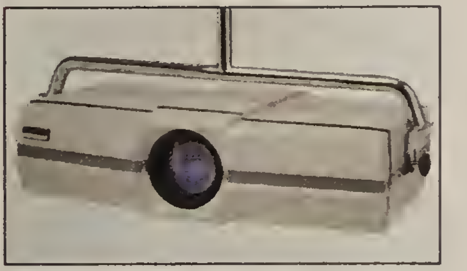

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usually considered important to a VDT's ergonomic quality:

- Screen design, consisting of image stability and flicker; luminance and contrast (including polarity); resolution; character size; character shape; interline and intercharacter spacing; screen size and capacity; and display housing (tilt, swivel, color and reflectivity.)
- Keyboard quality, including key design (shape, size, actuation force and travel, feedback and labeling); casing design (slope, height, shape, size, color and reflectivity); and arrangement of the alphanumeric keys (QWERTY or DVORAK) and function keys (cursor control and others). Detachable keyboards are desirable for general-purpose office applications because they permit flexible arrangement and use of the equipment. In other applications, however, an attached keyboard can be preferable.
- Other I/O devices, such as track balls, mice and touch-sensitive screens.

> **"**
>
> ***Historically, one of the first office items to be labeled ergonomic was easily adjustable furniture. This has become such a cliche that many people still think that ergonomics is synonymous with adjustable furniture.***

Office design

Designing workplaces for information technology consists of accommodating people's individual differences and their tasks as well as the technology itself. Some of the relevant factors include workstations and other furniture, climate, lighting, noise levels and office layout.

The color of office walls and the use of plants are mentioned in many popular press articles on ergonomics, though these are not strictly ergonomics issues. Within the domain of ergonomics, choice of wall color, plants and personalization of space fall more properly under the topic of psychosocial issues rather than office design.

As with all other aspects of ergonomics, there is no way to determine the best design of each component without first considering the tasks and the people involved.

Workstations. Historically, one of the first office items to be labeled ergonomic was easily adjustable furniture. This has become such a cliche that many people still think that ergonomics is synonymous with adjustable furniture.

Although it seems obvious that easily adjustable furniture is imperative to match a workstation to people's bodies and preferences, no reliable research has emerged to support its widespread use. We do not even have a clear picture of how people prefer to sit while performing office tasks.

One curious fact about adjustable furniture is that most people seldom adjust it, even if adjustment is easy. Several surveys indicate that a small minority of people take the time to adjust their equipment or know how to do it.

Ironically, after organizations invest large sums of money in making their workplaces "ergonomic" — often in response to strong employee demands — few employees take advantage of what they have.

One of the keys to the design of ergonomic workstations is to determine if easy adjustability is necessary. If a piece of furniture supports a user's body and tasks, then it can be labeled ergonomic, even if it is not easily adjustable. The tasks determine the best workstation sizes, layouts and reconfiguration capabilities. For example, split-level desks that have an independent platform for the keyboard were originally designed for applications in which users spend most, if not all, of their time typing. Using these tables for jobs that also require paperwork can be very cumbersome.

Lighting. Many people accept recommendations that the use of VDTs in offices requires lower lighting levels. These recommendations are often useless because they ignore the variety of tasks that workers perform.

If a person works with a VDT only for short periods of time, why reduce the lighting for all other tasks? Even in rooms where VDTs are used exclusively, some of the recommended lighting levels are too low for some users and tasks.

The glare problem, which has prompted most recommendations for lower light levels, is greatly exaggerated. A recent review of scientific studies shows that the glare problem is not as rampant as is reported and that VDT glare does not seem to cause anything more than a reduction in the readability of some portions of the screen. The link between glare and eyestrain has never been demonstrated, although many users complain about eyestrain attributed to glare. Some researchers have also shown that performance can be better without antiglare filters even when large bright spots of reflection appear on the screen.

The true cause of reflections is seldom investigated. For example, at an insurance company, several hundred antiglare filters were about to be purchased in response to complaints about glare. Yet the people in charge failed to realize that the

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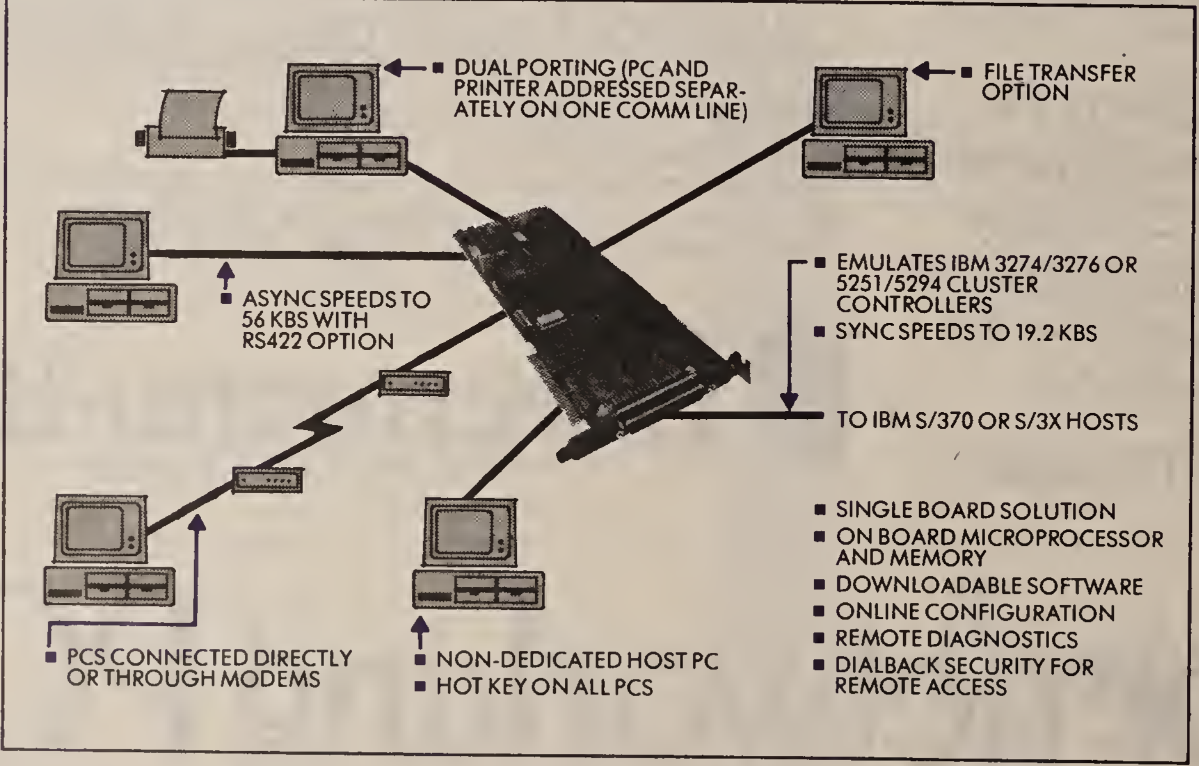
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VDTs already had antiglare filters bonded to the screens, filters that were so dirty that they had ceased to be effective. The best, and least expensive, solution to the problem was to establish a regular screen cleaning schedule. Ironically, the antiglare filters being considered were the same as the filters already on the screens.

Because lighting and glare are not always problematic, the need to take action should be established before money is spent on redesigning lighting conditions or on antiglare filters. If reflections are indeed the problem, researchers concur that the best solution is to redesign the lighting conditions — and sometimes to clean the screens — not to install filters.

Flexibility. Probably the single most important aspect of environmental design is flexibility, since it is virtually impossible to accommodate all people and all tasks with a single design. Flexibility means having available options for the shape, size and arrangement of equipment, furniture and office layouts.

This differs from adjustability, which is just one option: providing a range of settings within a single piece of equipment or furniture for each user.

Flexibility might require that different types of furniture and equipment be made available so that appropriate components can be combined for each user. Depending on the tasks, the components themselves may not need to be adjustable once they are installed. Flexibility also should allow for individual differences in work styles, such as the arrangement of equipment on the work surface, task sequence and self-pacing strategies.

Flexibility is not as easy to achieve as it might sound. But if designers keep it in mind, workplaces might become more ergonomic without costing more money.

Psychosocial needs

Introducing technology into the workplace can have both positive and negative effects on the way people work and relate to each other. Important issues to consider include people's natural resistance to change, job performance (including work schedules and determining work loads and rest breaks), task assignment to people and computers, training, individual control over work and environment, changes in management structures and new organizational procedures.

Computerization plans rarely take into account people's psychosocial needs, yet the highest paybacks may be found in this area. Depending on the objectives of the project, these paybacks might include increased productivity and job satisfaction, reduced turnover and absenteeism and less stressful working conditions.

A need for cross-organizational cooperation can cause a lack of attention to psychosocial issues. Any single department, such as DP, personnel or administration, is probably incapable of addressing companywide problems and taking the required corrective actions. The role of good business management is of prime importance in this area.

Standards and legislation

So far, Sweden and West Germany are the only countries that have binding regulations regarding VDT use. In Sweden these regulations are mainly the concern of employers, not VDT vendors.

Additionally, West Germany is the only country with binding regulations that affect the design of information technology. Most researchers around the world disagree with these regulations.

One of the regulations' main deficiencies is the lack of valid evidence to support the requirements. The following are some facts about the West German regulations that contradict popular myths in the U.S.:

- There is no requirement for screens with either amber characters or dark characters on light backgrounds. Images with any color except saturated blue or red and any polarity (dark on bright or bright on dark) are acceptable as long as other image requirements are not violated.

Moreover, no research has suggested that amber characters are better than green or white; the choice of color is strictly a personal preference. West German researchers and authorities are in full agreement with this.

- There is no requirement

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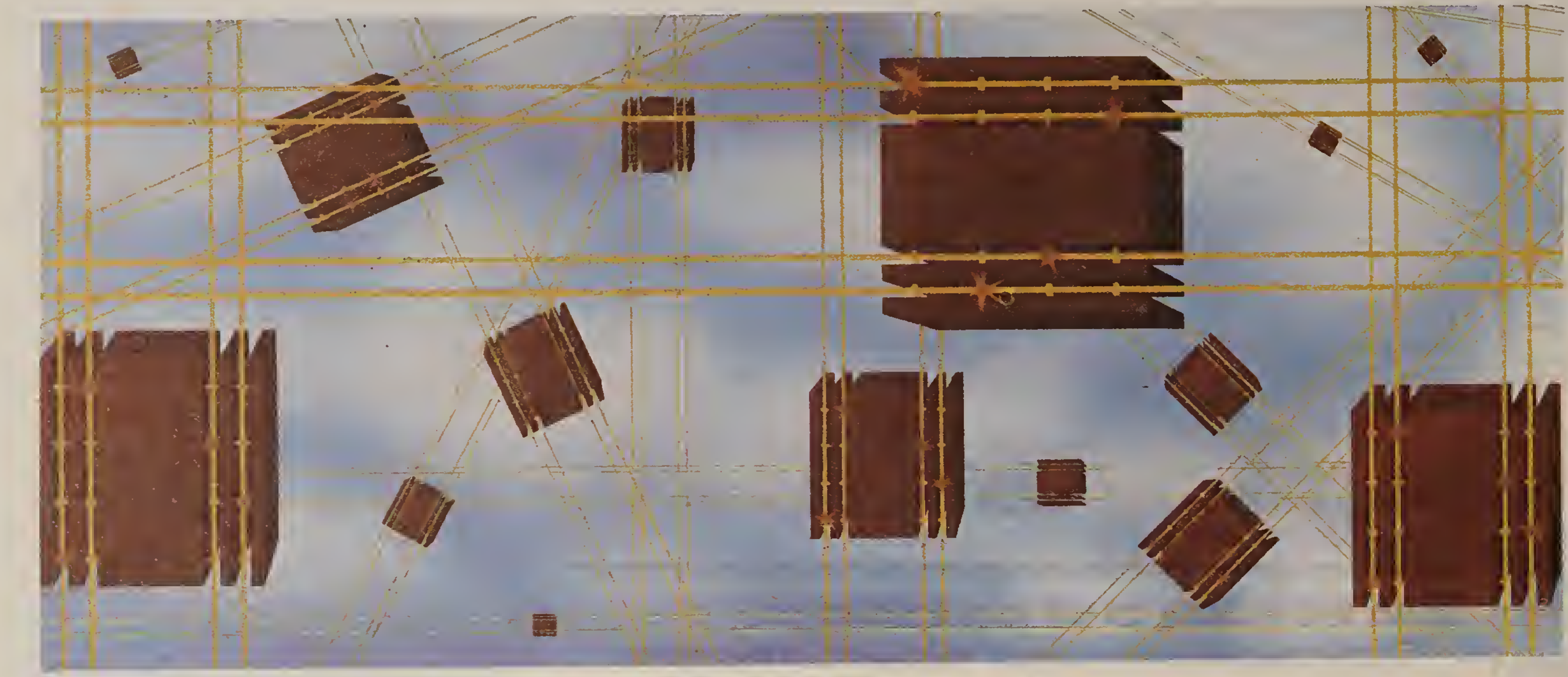

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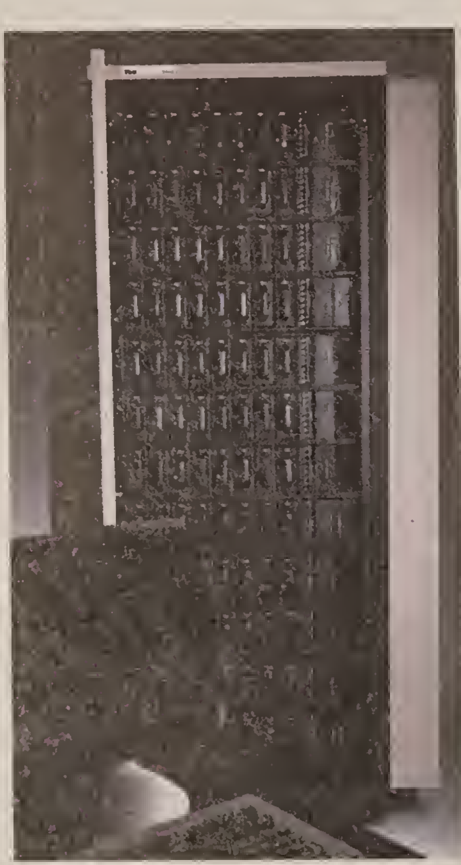

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> ***Those who are only interested in complying with legal requirements for VDT use do not have much to worry about — yet. But there may be rewards from incorporating ergonomics into the high-tech workplace, even if there are no laws that require it.***

for screens that are height adjustable.

- There is no requirement for easily adjustable tables. Easily adjustable chairs for office use are required.
- There is no requirement for contrast-enhancing glare filters. Screens with etched-front surfaces are acceptable.

In the U.S., there are no binding regulations so far. Despite attempts in many states to pass laws affecting VDT use, nothing has been approved yet that will mandate the type of equipment that is installed or how it is used. California has issued some guidelines for use within its state government; however, these guidelines have many shortcomings.

At the federal level, hearings by a U.S. House of Representatives subcommittee recently concluded with the recommendation that no further action be pursued by Congress; none is expected.

Within the private sector, the American National Standards Institute asked the Human Factors Society to work on a draft specification for some guidelines on the design of office VDTs and workplaces; the final version of the standard is expected to be ready this year.

Use of that document prior to its publication may be wasteful because the standard will probably undergo considerable revision up to the time of its final release.

The bottom line on standards is that those who are only interested in complying with legal requirements do not have much to worry about — yet. But there may be rewards from incorporating ergonomics into the high-tech workplace, even if no laws require it.

Those who have read this far may be a little confused about what they thought they knew about ergonomics. This approach, and the choice of examples it dictated, was deliberate. The purpose here has been to stress the need for objectivity in determining what is important or necessary.

Specific recommendations, such as "Dot matrices should be of X by Y size" and "Chairs must have this, that and the other feature to be ergonomic," are necessary but certainly not sufficient to achieve an ergonomic workplace. Philosophy, methods and commitment are some of the other required ingredients.

Blueprint for success

The blueprint for successful ergonomics contains recommendations that are the same as those found in other problem areas. These include setting the right objectives, applying proper methodologies and obtaining the commitment of everyone involved.

- **Objectives.** As in most other areas, success depends on objectives. These not only serve as a guide and "umbrella" for making decisions but also provide benchmarks for determining whether success was achieved.

In some cases, it is possible that the real problem can be recognized, and sometimes solved, by the search for objectives. The case of a major insurance company illustrates this point. In its search for goals, its VDT task force realized that the low morale within the company arose not from the use of VDTs in bad workplaces but from higher level problems within the organization.

Whatever the reasons or motivation, each organization must determine its own specific ergonomic goals. A large public utility cannot be expected to have the same ergonomic objectives as a small manufacturing firm. Some organizations may have problems in personnel turnover, for example, while

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The Amraam missile gains its high reliability in part through the packaging of some electronics. Leadless carriers are used to package hybrids and electronic components that are made of ceramic material and are soldered to ceramic circuit boards. This packaging permits better automated handling and loading of these devices on circuit boards. Leadless carriers are attached to boards using a vapor phase reflow soldering process. Loaded assemblies are placed in a heated vapor so the solder will melt or reflow in a few seconds. The process results in soldered connections that are highly reliable. Hughes Aircraft Company designed and developed the advanced medium-range air-to-air missile for the U.S. Air Force and Navy.

A new processing technique eliminates impurities in an optical fiber that has promising uses in the mid-infrared region of 1 to 5 micrometers. Zirconium fluoride glass fibers, which are typically prepared in an atmosphere of inert gases, contain defects that scatter light transmissions and preclude their use in long fiber links. Scientists at Hughes Research Laboratories, however, have prepared molten glass at 850°C using a novel reactive atmosphere process. This special process competely eliminates the chemical interaction with impurities, which yield light-scattering defects.

A new ion thruster that operates on xenon gas has proven to be vastly superior to previous designs that operated on mercury propellant, offering a number of benefits to spacecraft designers. The xenon thruster would be used by communications satellites to stay precisely on station 22,300 miles above Earth. It is much simpler mechanically and yet more powerful than the mercury ion thrusters developed earlier. In fact, it could reduce the weight of a large satellite by 15%—meaning that launch costs could be trimmed, or more communications equipment could be packed into the same satellite. The thruster would operate for about an hour and a half each day, accumulating 5,000 hours during a 10-year period. Hughes Research Laboratories conducted the studies under contract to INTELSAT.

Gold thread finer than the most delicate spider web can be bonded onto an area about the size of a mote of dust with a new bonding technique for microcircuits. The process uses a Hughes automatic wire bonder modified to handle ultrafine wire 1/2000 of an inch in diameter. A tiny ceramic capillary tube slides down around a wire and presses the end of it against a gold pad on the microchip. A blast of ultrasound causes the tip of the wire to vibrate back and forth, creating enough heat from friction to form the bond. The capillary then automatically moves up and across to the next pad. With another downstroke, the wire is cut cleanly and bonded to the pad, creating what is called a stitch bond. The process takes less than a second per wire (compared to one minute for conventional bonds), leads to less rework, and requires less material. Designers of chips for advanced airborne radars may now opt for more circuitry packed into the same space, or for a smaller faster chip with no loss of circuitry.

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others may have difficulties in quality control.

■ **Methods.** To achieve the benefits that ergonomics offers, things must be done correctly. Along with setting objectives, the following recommendations should be followed:

Take a "systems" approach. This means placing the human being at the center and then exploring all possible aspects that could affect the established ergonomics objective. Some of the actions that this approach implies are determining what factors affect people, finding the possible interactions among all relevant factors and setting a path of action that involves the highest paybacks first.

Take a multidisciplinary approach. Several disciplines may be necessary to determine tasks, equipment and human requirements. Limiting the analysis to one or two areas, such as environmental design or computer systems analysis, is a sure way to solve unnecessary or low-benefit issues.

Adhere to objective methods of investigation and evaluation. This includes following a comprehensive plan or design model. For example, rather than going directly from defining functionality requirements to programming, successful ergonomics design of user-system interfaces includes applying various ergonomic methods and tools at each stage of the project. Some of the tools ergonomists employ include task analysis, time and motion studies, simulations, prototyping, iterative testing, comparison of alternatives and the study of critical incidents.

Ergonomics testing is a particularly interesting and useful tool. In engineering of information technology, testing usually means looking for errors — bugs — or physical resilience, such as testing for electromechanical safety. Ergonomists perform usability tests to ensure that equipment and systems conform to their users' tasks, capabilities, limitations and preferences.

■ **Commitment.** Despite the technical nature of ergonomics, its largest positive contributions will occur after organizations stop treating it as a specialization within the DP or environmental design departments. Ergonomics is a discipline in its own right. However, everyone in an organization should be aware of its existence and should support the application of ergonomic solutions to information technology.

This will happen only when managers at all levels are committed to the role of ergonomics in the successful use of technology. Such commitment should take the form of active participation; verbal acknowledgement alone is seldom sufficient. Management's commitment to ergonomics will be critical to the continued and successful use of information technology.

So far, many organizations consider ergonomics in response to claims that VDTs are health hazards and to impending laws on VDT design and use. It is sad that accommodating the physical and psychological needs of people for the sake of their efficiency and well-being is not the prime motivator.

Fortunately, this is changing as quantifiable data becomes available to show that addressing people's needs makes sense.

Some of the reported benefits that organizations attribute to ergonomics are productivity increases, fewer employee complaints, improvements in product quality and lower personnel absenteeism and turnover. Although these quantified results cannot be generalized from one organization to another, they show that addressing people's needs can produce direct, positive effects. ■

Education, not experts

The sudden demand for information on ergonomics has caused the emergence of many people who claim to be ergonomists but who lack the proper qualifications. These "experts" are dubbed "overnight ergonomists" because their knowledge of the field usually appears overnight. Because their methods consist mainly of simplistic surveys and they rely on press clippings and vendor literature for their information, overnight experts are usually responsible for the worst failures.

If most other areas of an organization are staffed by qualified experts, why should ergonomics be left to the overnight expert? Being an ergonomist does not simply mean reciting a list of equipment design features.

The multidisciplinary nature of the field makes it almost impossible for a single individual to be an expert in all areas. The more knowledgeable people are about ergonomics, the less they will try to convince everyone else about their understanding of all pertinent issues. Choosing the right experts for the job may be hard, and it may appear to be expensive, but it usually is more advisable and less expensive in the long run than relying on overnight ergonomists.

Many of the problems related to the use of information technology can be resolved through training and education. Issues such as radiation, the effective use of furniture, fear of the unknown experienced by many people when they first start using a computer and the ergonomic computer system design can be dealt with effectively in this manner.

— **Richard Koffler**

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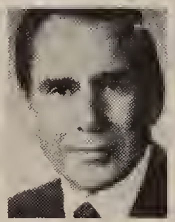
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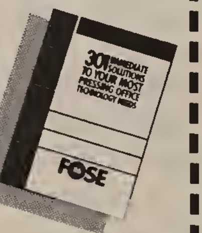
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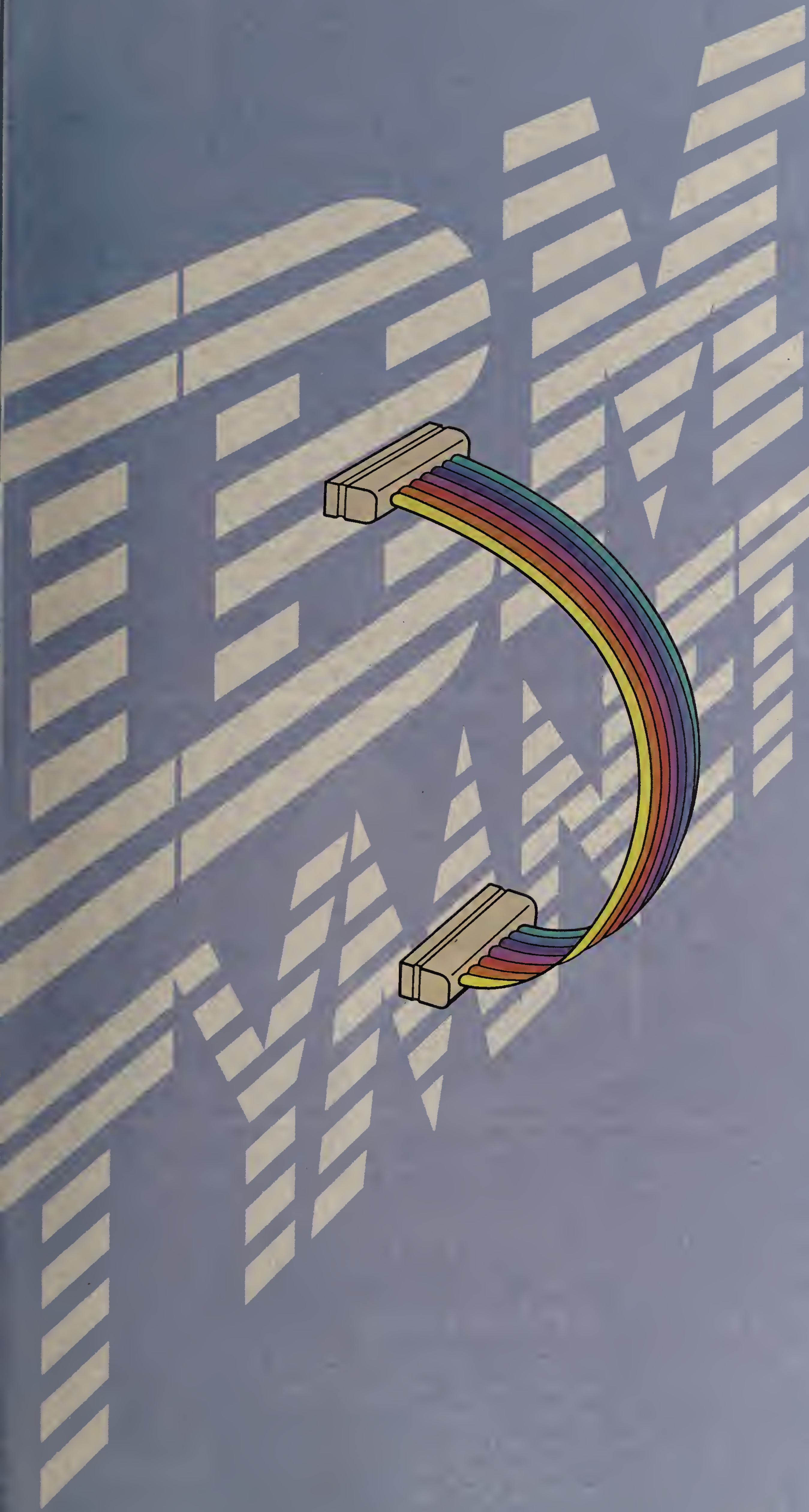

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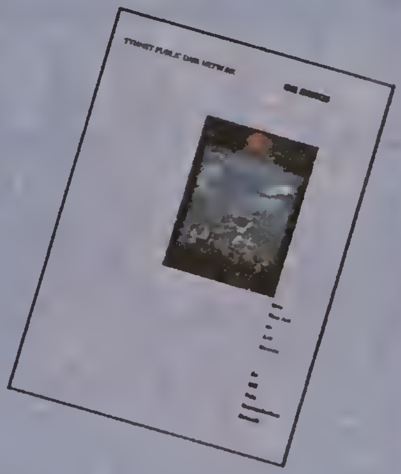

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Merger mania strikes at the heart of the information economy

A new form of imperialism has emerged from the changing information industry. Geography no longer sets the boundaries of conquerable territory — now corporations fall victim to modern, acquisition-hungry Huns.

By CHARLES VARGA and VICKI BROOKS

"Nolio unquam oblivisci, Carole: Peceniam sapientiam esse."

A rough translation of the Latin phrase goes something like this: "Never forget, Charlie: Money is wisdom."

But since 1982, the computer industry has seen a new wave of megadeals and a new group of instant millionaires rise via acquisitions and mergers. Many of these modern executives sought comfort and guidance from the story of history's notorious acquisition pair, Hun and Khan, who ruled supreme for nearly two decades over most of Europe, acting out such aspects of the acquisition and merger game as pillage, plunder, ravage and burn.

These modern acquirers coined a new slogan for the industry: Information is money.

Clearly the information industry is a money industry — a money machine. In today's big business of software and services, the names of the top 40 companies show some resemblance to those of a decade ago, but many names are missing — some just in the last year. The $1 million and $2 million deals of a decade ago have been replaced by half-billion-dollar ones.

The industry's composition is changing: It is becoming a conglomeration of international corporate information states, some bigger than many nations. A threat lurks in this change — the threat of a new form of imperialism no longer based on acquisition of earthbound territories but on acquisition of information.

The young entrepreneurs, who were still in amniotic fluid when many of us completed our first deal, might feel that except for the personal computer and a number of quick fortunes that have been made and lost, nothing essential to the computer community has really changed.

But every year something new shakes the industry to its very roots. In 1984, it was General Motors Corp.'s paying the highest price in the history of computers for what had been an upstart computer services company in Dallas — Electronic Data Systems Corp. (EDS). Then in 1985, GM acquired Hughes Aircraft Co. for $5 billion-plus, while tiny guppy Sterling Software, Inc. swallowed whale Informatics General Corp. Other multimillion- and multibillion-dollar giants went on acquisition binges, the cost of which would make the gross national product of almost any developing country look like Monopoly money.

What is becoming apparent is that the once-tiny computer software, services and information industry has given birth to the first generation of what could be called sovereign corporate information states. This is no longer small business, it is big business, and in this big business, views are changing. What began as "money is love" has evolved into "information is money" and indeed, for some in the industry, into the corollary that "information is wisdom."

Rise of the sovereign state

We can identify the first candidate for sovereign information statehood (outside of the U.S. government): It is the IBM corporation.

Why? No other single entity could have negotiated so favorable an end to its antitrust suit with the U.S. Department of Justice and within a year also settle its dispute with the Common Market communities.

The second nominee for sovereign information statehood is a company that has really been one all along. AT&T, although now many companies rather than one, still commands special regard from world governments.

Third, GM, with its recent acquisition of EDS and Hughes Aircraft, holds

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Varga and his wife, Vicki Brooks, founded The Cerberus Group, Inc., a consulting and planning services firm in Frenchtown, N.J. Varga is publisher of "The Cerberus Report" on acquisitions and investment opportunities and is senior partner in the Hunterdon Group, merger consultants.

a special place in the world information economy.

Fourth, General Electric Co.'s acquisition of RCA Corp. puts it in the running for sovereign information statehood.

Fifth, Allied Corp.'s purchase of Signal Companies, Inc. provides Allied with global reach.

Further, Burroughs Corp.'s canceled bid for Sperry Corp. and General Electric Co. Plc.'s run on Plessey Co. Plc. make them formidable contenders for information statehood.

The key question in all of these cases is this: Do those firms seeking to achieve country-size critical mass really need this status for competitive global outreach?

Health, wealth and happiness

Fond memories of childhood in a Hungarian-Polish household in the U.S. during the pre- and postwar 1940s and 1950s revolve around large gatherings of family and friends, usually celebrating a marriage, birth or holiday or marking a family member's death.

After the evening meal would come the telling and retelling of stories, usually from the "old country." The eldest family member would usually begin the tales, and the children would chime in with questions and recitations.

Before she retired to bed, Grandmother would always deliver the following toast: "I wish you health, wealth and happiness! If you have the first, you already have the others."

The wit and wisdom of this saying can be applied directly to the computer services, software and information industry. As analysts attempt to evaluate the health of an individual company or of groups of firms, they measure each company's accumulated wealth or earning power and equate this with some measure of happiness.

The fact is, many outsiders look upon the information industry as having some form of "social disease" — and with good reason. Others characterize the recent past as "the year of the storm" or "a year to forget." And if the information industry gathers to mark a death, it will be the loss of the public market and private sources of venture capital funding.

Downward spiral

There are many reasons for all the gloom and doom, although trying to delineate them is awkward and provides little consolation. Also of little consolation to the industry is that general

Acquisitions of more than $50 million in 1985

Buyer	Seller	Price Paid (Dollars in Millions)	Notes
Dow Jones & Co.	*Telerate, Inc.*	$460	
MCI Communications Corp.	*Satellite Business Systems*	460	
Pacific Telesis Group	*Communications Industries, Inc.*	431	
American Express Co.	*First Data Resources, Inc.*	239	Remaining 25%
Ameritech	*Applied Data Research, Inc.*	215	
Investor group (Welsh, Whitney)	*Mohawk Data Sciences Corp.*	180	Five U.S. units*
Investor group	*Times Mirror Microwave Communications Co.*	175	
Sterling Software, Inc.	*Informatics General Corp.*	144	
Convergent Technologies, Inc.	*3Com Corp.*	133	Merger
Lockheed Corp.	*Metier Management Systems*	127	
Times Mirror Co.	*Xerox Learning Systems*	117.5	
Continental Telecom, Inc.	*American Satellite Co. and Space Communications Co.*	105	
Bell & Howell Co.	*University Microfilms, Inc.*	100	Xerox Corp. unit
Investor group (Edleman)	*Datapoint Corp.*	100	Leveraged buy-out
Loral Corp.	*Rolm Corp. Mil-Spec Computer Division*	100	IBM unit
Reed International Plc.	*R. R. Bowker & Co.*	90	
Baxter Travenol Laboratories, Inc.	*Compucare, Inc.*	73	
Reuters Holding Plc.	*Rich, Inc.*	57.5	
UNC Resources, Inc.	*TRT Telecommunications, Inc.*	56	
AT&T	*Communications Satellite Corp.*	55	50% of each of three stations
Allnet Communications Services, Inc.	*Lexitel Corp.*	53*	Merger
Martin Marietta Corp.	*Equatorial Communications Co.*	50	
	Total	$3,521	

* Estimated

Source: The Cerberus Group, Inc.

Figure 1: The top 22 megadeals out of 290 mergers and acquisitions in the software, services, communications and information industries each cost $50 million or more.

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		Purchase	Per Month		
	Description	Price	12 Mos.	24 Mos.	36 Mos.
DEC	LA50 Personal Printer	$ 599	$ 58	$ 32	$ 22
	LA210 Letter Printer	1,299	125	70	47
	LA120 DECwriter III KSR	2,195	211	117	79
	VT220 Video Terminal	849	83	46	31
	VT240 Graphics Terminal	1,850	178	99	67
	VT241 Color Graphics Terminal	2,650	255	142	95
	LN03 Laser Printer	3,295	316	176	119
TI	TI707 Portable Data Terminal	$ 550	$ 53	$ 30	$ 20
	TI820 Data Terminal PKG KSR	1,995	192	107	72
	TI855 Dual Mode Printer	649	63	35	23
	TI865 Dual Mode Microprinter	810	78	43	29
WYSE	WY50 Video Terminal	$ 459	$ 44	$ 25	$ 17
	WY75 Video Terminal	559	56	30	20
	WY85 Video Terminal	495	47	27	18
PANASONIC	FT70 Executive Partner PC with 640K RAM	$2,395	$229	$128	$ 87
NORTHERN TELECOM	NT6K90 Displayphone Plus	$ 995	$ 97	$ 54	$ 37
CITOH & CIE	CIT-220 + Video Terminal	$ 775	$ 75	$ 42	$ 28
	CI-300 Matrix Line Printer	4,045	388	216	146
	CI-3500 Serial Printer	1,550	149	83	56

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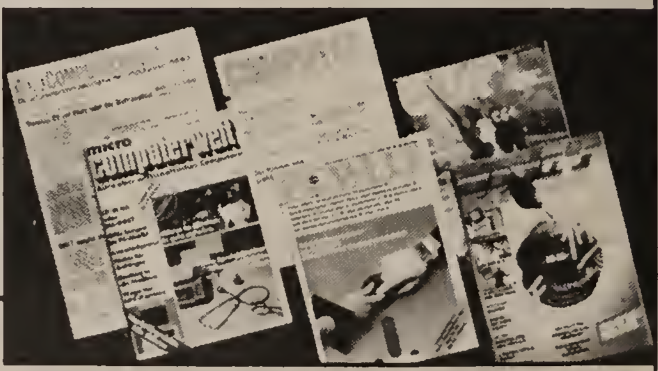

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market conditions were also down at the start of the crisis time: The Dow Jones Industrial Average decreased 3.7% and the Standard & Poor 500 index decreased 1.4% between 1983 and 1984.

A recent study by Vanguard Atlantic Ltd. shows that average share price declined by 28.5% between 1983 and 1984. The study, called "Values" (Volume 1, Edition 1), notes that only nine firms out of a total of 34 public companies showed an increase in market value, and only one firm, Software AG, grew by a healthy 28%.

Continuum Co. showed an increase in market price of 22.5%, followed by Uccel Corp. at 17.9%. Gains were also made by Cullinet Software, Inc., whose market price improved by 10.4%, and Automatic Data Processing, Inc., posting a 9.9% improvement.These firms chalked up significantly good performances in a significantly bad year.

Except for Cycare Systems, Inc., which showed an increase of 2.2% in market price, all other companies in Vanguard Atlantic's sample of 34 public computer services firms showed a decline in market value, which culminated in an average decline in share price of 28.5%.

While many firms demonstrated moderate to dynamic growth as measured by improved sales, it was acquisitions and mergers in the information industry that contributed both to accelerated revenue growth and market share.

Dennis Hamilton, editor in chief of "ICP Business Software Review," made what is perhaps the most telling statement, pointing out that almost $3.5 billion of the recorded $4.4 billion increase in software product and services revenue among the top 200 firms belonged to only 25 companies.

The remaining $900 million was spread over the other 175 companies.

The conclusion we reach is that although sales were up in 1984, profitability and value as measured by market price were down, forcing an inordinately high rate of consolidation, with higher premiums paid for strategically postured firms with strong profit performance.

Record 1985 reported

With dollars and deals up, merger mania continues in the information industry, driven by the heated pace and momentum of 1984's and 1985's record-breaking activity. Total dollars paid for all transactions disclosing purchase price hit a record-setting $4.869 billion for 1985 — up 6.7% from the $4.565 billion paid in 1984. This nominal increase was expected, considering the 80% increase experienced in the 1983 to 1984 time frame.

Net acquisition and merger activity for the period rose to 290 net acquisition and merger announcements compared with 256 for 1984 — an increase of more than 13.3%. The value of 1985's 22 top ($50-million-plus) information industry megadeals reached only $3.521 billion, after a $3.848 billion total for 1984 — a decrease of 7.5% (Figure 1).

Of these 22 deals, seven transactions were in the telecommunications services and equipment sector.

Major announcements for the period appeared to fall into the following categories:

- Information industry megadeals, in which price paid was $50 million and above.
- Middle-range or second-tier transactions, in which the offer price was between $10 million and $50 million. There were 37 of these types of deals in 1985, representing $764 million in total dollar value paid (Figure 2).

Three transactions in the billion-dollar-plus range will profoundly affect the basic fabric and structure of all aspects of the information industry: GE's purchase of RCA for $6.23 billion, GM's purchase of Hughes Aircraft for more than $5 billion and Allied's purchase of Signal for $4.9 billion.

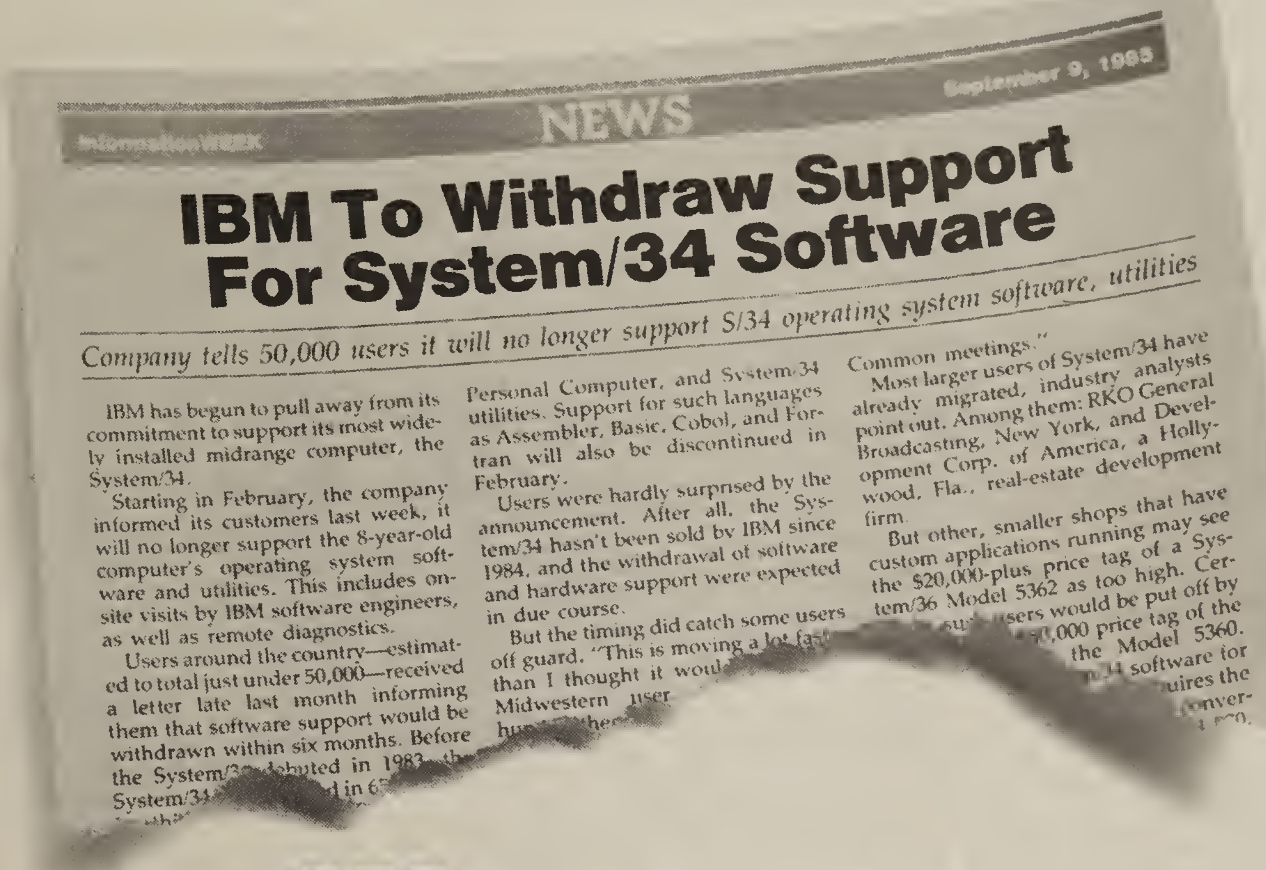
GM's acquisition of Hughes Aircraft adds the jewel to its crown. With its takeover of EDS, GM has gained commercial and military electronics, satellites and information processing technology. It now not only reaches into the purses of individual households in the U.S. through car sales but also keeps some of the nation's highest national security secrets.

Another highlight in this group was the guppy swallowing the whale: Sterling Software acquired Informatics General — 10 times its size.

For those buyers that disclosed offer prices, which excludes the industry's seven largest transactions, the average price was $206 million. Among emerging firms, the median offer price was $9.75 million, up 41% from the $6.9 million recorded for the year before.

The amount of disparity between companies' earnings and their selling

> ❞
>
> ***While many firms demonstrated moderate to dynamic growth as measured by improved sales, it was acquisitions and mergers in the information industry that contributed both to accelerated revenue growth and market share.***



InformationWEEK NEWS September 9, 1985

IBM To Withdraw Support For System/34 Software

Company tells 50,000 users it will no longer support S/34 operating system software, utilities

IBM has begun to pull away from its commitment to support its most widely installed midrange computer, the System/34.

Starting in February, the company informed its customers last week, it will no longer support the 8-year-old computer's operating system software and utilities. This includes on-site visits by IBM software engineers, as well as remote diagnostics.

Users around the country—estimated to total just under 50,000—received a letter late last month informing them that software support would be withdrawn within six months. Before the System/3[illegible] debuted in 1983, the System/34 [illegible]

Personal Computer, and System/34 utilities. Support for such languages as Assembler, Basic, Cobol, and Fortran will also be discontinued in February.

Users were hardly surprised by the announcement. After all, the System/34 hasn't been sold by IBM since 1984, and the withdrawal of software and hardware support were expected in due course.

But the timing did catch some users off guard. "This is moving a lot fa[illegible] than I thought it woul[illegible] Midwestern user [illegible]

Common meetings."

Most larger users of System/34 have already migrated, industry analysts point out. Among them: RKO General Broadcasting, New York, and Development Corp. of America, a Hollywood, Fla., real-estate development firm.

But other, smaller shops that have custom applications running may see the $20,000-plus price tag of a System/36 Model 5362 as too high. Cer[illegible] users would be put off by [illegible],000 price tag of the [illegible] the Model 5360. [illegible] software for [illegible]uires the [illegible] conver-

WANG HAS THE SOLUTION.

Once again, IBM is relegating one of its major products to the computer junkyard.

This time, the victim is the System/34 – and the 50,000 System/34 users who thought they could depend on it.

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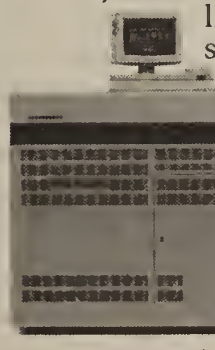

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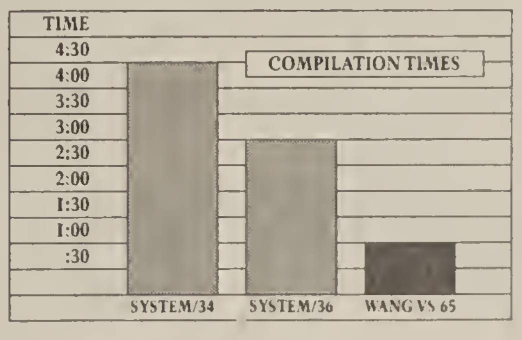

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Largest second-tier acquisitions of 1985

Buyer	Seller	Price Paid (Dollars in Millions)	Notes
Micom Systems, Inc.	*Interlad, Inc.*	$47.25	
Corvus Systems, Inc.	*Onyx + IMI*	45	
Continental Telecom, Inc.	*Northern Data Systems, Inc.*	36	
Information Resources	*Management Decision Systems, Inc.*	30.4	
Mellon Bank Corp.	*Carleton Financial Computations, Inc.*	30	
National Computer Systems, Inc.	*Commonwealth Leasing Corp.*	28	
Atlantic Research Corp.	*Systematics General Corp.*	27.5	
Systems Designers International Plc	*Warrington Associates, Inc.*	26	
Planning Research Corp.	*Kentron International, Inc.*	25.9	61%
Computer Associates International, Inc.	*CGA Computers, Inc.*	25	Product line acquisition
Hospital Corporation of America	*Healthgroup International*	23.8	
Bell Atlantic Corp.	*Compushop, Inc.*	23.1	
Ashton-Tate	*Multimate International Corp.*	22	
Recognition Equipment, Inc.	*Mohawk Data Sciences Corp.*	22	Five European subsidiaries
Private investor group (FMR Corp. & Fidelity International Ltd.)	*American District Telegraph Co.*	20.3	7%
Ing. C. Olivetti & Co. SpA	*Docutel-Olivetti Corp.*	20.2	Remaining 54%
Ford Motor Co.	*American Robot Corp.*	20	Acquired interest
Investor Group (Joe Rosso)	*United Press International*	20	Acquired interest
Orion Capital Corp.	*RCA Corp.*	20	5.6%
Zenith Electronics Corp.	*Inteq, Inc.*	20	
McDonnell Douglas Corp.	*Republic Health Corp.*	17.6	
Net America, Inc.	*Nestar Systems, Inc.*	17.5*	80%
Lex Service Plc	*Almac Electronics Corp.*	17	
Shared Medical Systems Corp.	*Computer Synergy, Inc.*	15.8	
American Network, Inc.	*CP National Corp.*	14.9	Unit
Ford	*Carnegie Group, Inc.*	14	10%
Ford	*Inference Corp.*	14	10%*
Investor group	*UPI*	14	Acquired interest
Investor Group	*Ennis Business Forms, Inc.*	13.3	10.9%
National Business Systems, Inc.	*Dek Identification Systems (Division of Mohawk Data Sciences)*	13	
British Petroleum Co. Plc	*Telecom General Corp.*	12.5	80%
McDonnell Douglas Information Systems Group	*Applied Research of Cambridge, UK*	12.5	
Investor group (Lafer Amster & Co.)	*Graphics Scanning Corp.*	11.9	5.5%
Metromail Corp.	*Market Development Corp.*	11.5	
Computer Entry Systems Corp.	*General Instrument Corp.*	11	Unit
Investor group (Maxxam & TSG)	*Informatics General Corp.*	11	13.3%
Uccel Corp.	*Corodale, Inc.*	10	
	Total	$763.95	

* Estimated

Source: The Cerberus Group

Figure 2. Second-tier acquisitions contributed to the total $4.869 billion paid for deals in the software, services, communications and information industries in 1985, up 6.7% from 1984.

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prices was, as usual, all over the lot, and it varied by earnings contribution and size of deal.

New growth path

Noting these trends, industry observers must ask, Have acquisition and merger strategies today, as in the past, really been used as an alternative path toward international sales growth? Do companies use these strategies as a means of gaining a competitive advantage in timing, seasoned management and profit increases without the risks of research and development?

Many in the industry could effectively debate these noble aspects of the great game. Many could also recognize modern-day Robin Hoods who steal from everyone to give to themselves.

> ***Some of the acquisitions and mergers recorded in the last few years could be characterized as 'acquisitions of greed' and 'ego-trip acquisitions.'***

Some of the acquisition and merger announcements recorded in the last few years could be characterized as "strategic acquisitions." Other categories include "acquisitions of need," "acquisitions of greed" and "ego-trip acquisitions."

On the other end of the scale, one chief executive has found a new class of deals wherein the acquired company suffers from old age and tremendous losses and its only salvation is a form of "corporate euthanasia."

This executive quipped, "We just put the company gently to sleep."

What, then, are the key differences in the corporate state of the 1980s and those of the early 1900s?

William O. Douglas, in his book, *An Almanac of Liberty* (Doubleday & Co., 1954) gave us some insights 30 years ago with his discussion of Lewis D. Brandeis, a Boston lawyer whom President Wilson appointed to the U.S. Supreme Court.

"The lessons Brandeis taught have been largely forgotten," Douglas wrote. "More and more our best brains are retained to promote a new creed of the corporate information state — 'monopoly competition.' "

The 'curse of bigness'

Brandeis saw the "curse of bigness" as a blight on the industrial world. Companies were big not in the interests of efficiency but largely in the interests of monopoly. Companies grew so big that they were beyond the competence of management to operate efficiently.

What Brandeis foresaw was that the big corporate information state would leave no room for newcomers. He further postulated along with President Wilson, "The treasure of America does not lie in the brains of a small body of men now in control of the great enterprise, . . . it depends upon the inventions of unknown men, upon the obligations of unknown men, upon the ambitions of unknown men."

Just a few short years before Douglas wrote his study of Brandeis, the Celler Anti-Merger Act was enacted (December 1950). It provided that no corporation, whether or not it was engaged in commerce, shall acquire the whole or any part of the stock or assets of a corporation if the effect of the acquisition or the use of the stock "may be substantially to lessen competition or to tend to create a monopoly."

The reasons that Congress gave for the law were the desire to keep the American competitive system alive and to slow the continuing growth of monopolies.

At that time, the long-term trend of concentration of industrial power in the hands of a few had been due in considerable part to mergers.

In the decade before passage of the Celler Act, there were at least 2,500 independent manufacturers and mining companies that were swallowed up in mergers. Much more acquisition and merger activity took place in small business than in any other.

It is apparent that earlier laws had proved largely ineffective, because of both their construction and the hostility of the courts in their subsequent application.

Stimulating factors

What is taking place today is the same pattern of big companies buying up little ones, not the little ones combining to resist the large ones.

Within the information processing industry, this has been the classic growth path to seeking and achieving one's just rewards.

In 1984's computer software, services and information industry alone, the top 20% (40 firms) represented 78.9% of the total revenue volume.

Tomislava Simic, vice-president of research for the leading merger consultants W. T. Grimm and Co., identifies a number of factors that have stimulated merger and acquisition activity. They

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> ”
>
> ***Acquisitions and mergers have become accepted tools for implementing alternative growth paths and executing corporate objectives and, often, an unwanted executive or two.***

include the following:

- The 1981 Economic Recovery Tax Act.
- Banking deregulation.
- Government antitrust and deregulation policies.
- Liberal availability of financing.
- The rise of shareholder advocacy.

Simic notes the appearance of new participants on the acquisition and merger scene, especially in the information processing industry — participants like GM and IBM. He points to the new breed of corporate raiders, greenmailers and merger arbitrageurs — Carl Icahn, Irwin Jacobs, T. Boone Pickens, Bennett LeBow, Iven Boesky and Asher Edelman — raiders he expects will be a continuing menace.

As to the impact on certain target industries, Simic states, "Whereas the software sector undergoes consolidation to accommodate a fast-growing industry, the already maturing hardware segment will consolidate as the number of players becomes too large for the market's growth size."

It is not uncommon to hear that Attila the Hun and Ghengis Khan acquired most of central Europe from the Caspian to the Rhine not only because they had brute force, but also because they had good tax men. Indeed, it will be the consequences of the treasury's tax reform plans that could provide a real surge in the sales of privately held businesses.

One thing is certain: The pace of transaction activity continues unabated. If acquisitions and mergers hold this rate through 1986, overall announcements should total approximately 250-plus transactions — a slight decrease from last year.

If median offer prices of $9.75 million continue to hold at the low end and high-end industry megadeals vary from an average of $15.3 million to $21 million, then total volume for the year will fall between $2.4 billion and $3.8 billion.

Acquisitions and mergers have become accepted tools for implementing alternative growth paths and executing corporate objectives and, in many cases, an unwanted executive or two.

Information economy

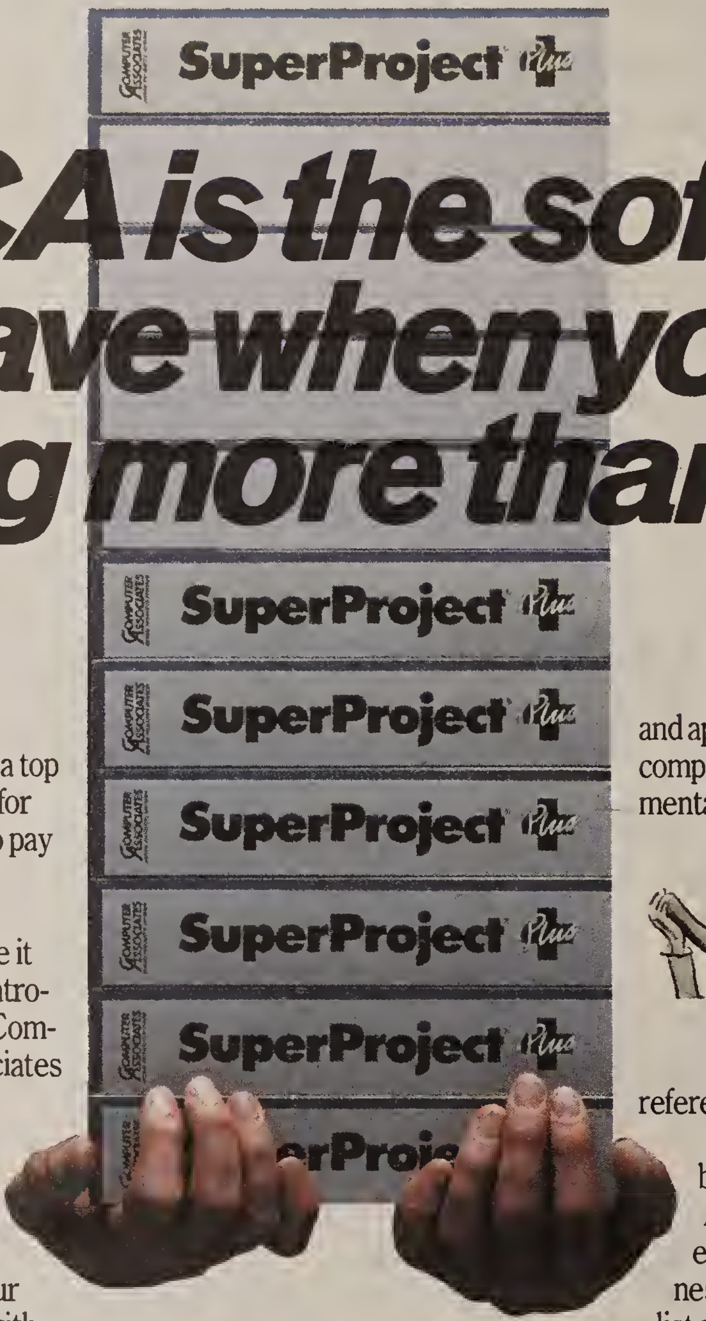
Through the '70s and into the '80s, an information economy — fueled by a rapidly changing technological revolution — severely diminished the position of certain traditional industries and stimulated and created new ones in video, electronics and leisure groups.

This information-driven economy has forced individual company managers as well as chief executives of billion-dollar corporations to rethink their strategic plans because of the effects of increased international competition, higher interest rates, imbalanced international money markets and the compounding effects of inflation and deflation.

Both the manager of the tiny company and the international executive have viewed acquisition and merger strategies as a profitable opportunity and as a method to get a jump on competitors in rapidly maturing markets.

Overall, whatever happens in 1986 will be determined not only by the economic picture but also by any chaotic changes in the economy, as well as other industry transitions, financing opportunities affected by tax reforms and the key question of the continued availability of quality firms within the information processing industry.

If one thing is clear, however, it is that, as the phrase goes, "Never forget, Charlie: money is wisdom." ■



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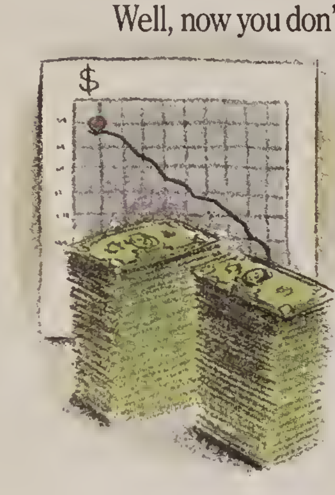

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HP extends dot matrix line

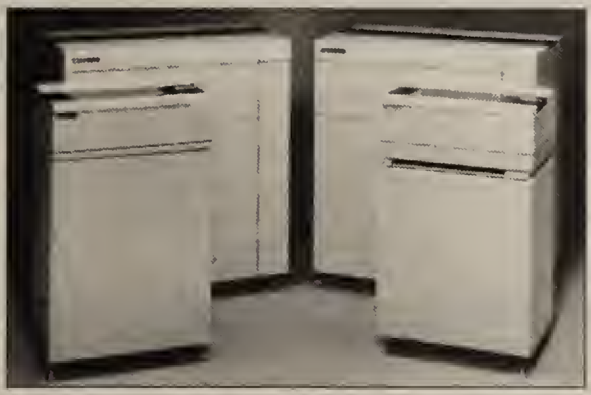
Adds two printers, boosts raster graphics of original

Hewlett-Packard Co. of Palo Alto, Calif., has introduced two new dot matrix printers and has enhanced one of the original printers in the dot matrix line.

The HP 2567B is said to be a 1,200 line/min printer. According to the vendor, it also has the capability to print 1,600 lines per minute using a sparse matrix character set, which reportedly increases printing speed by using fewer dots to create a character.

The HP 2564B is a 600 line/min heavy-duty printer. The HP 2566A, HP's original 900 line/min dot matrix printer, has been enhanced to include higher resolution raster graphics at both 70 and 140 dots per inch and additional character sets. It is now called the HP 2566B.

The dot matrix line printers provide the ability to select characters for multiple languages, line drawing and different sizes and fonts using HP's printer command language. The printer family's standard HP Roman 8 character font supports 13 different languages, including English, French and German.


Hewlett-Packard Co.'s family of dot matrix printers supports 13 different languages.

These printers reportedly offer a total dot matrix line printer solution for HP 3000, HP 1000 and HP 9000 computer users with HP-IB and RS-232C or RS-422A interfaces.

In addition, Centronics Data Computer Corp. and Dataproducts Corp. parallel interfaces are available for other system users.

The HP 2567B costs $28,050. The HP 2564B is priced at $9,995, and the HP 2566B sells for $21,766.

Zitel unveils bulk memory

Zitel Corp. of San Jose, Calif., has announced the RAMdisk/3200 family of modular peripheral solid-state bulk memory products for the Perkin-Elmer Corp. 3200 series systems.

The RAMdisk/3200 reportedly provides system performance boosts ranging from 20% to 2,000%. It was designed for use with any PE 3200 series CPU using the OS/32 operating system. It plugs directly into the selector channel bus and is compatible with 3200 Memory Storage Module and Intelligent Disk Controller formats.

Standard features are said to include single bit error correction and double bit error detection. An optional battery backup offers 30 minutes to two hours of continued operation in case of a power failure.

The basic configuration, a rack-mounted chassis with 8M bytes of semiconductor memory that can be expanded to 32M bytes, costs $14,498. A stand-alone cabinet with self-containing interface and the battery backup power is also available.

On-line programming tool out, transforms logical views to user language applications

Expert Software Products, Inc. of Buffalo, N.Y., has introduced its Automated Development Center, an on-line menu-driven software programming tool.

According to a company spokesman, Automated Development Center transforms logical views of data into Computer Corporation of America's Model 204 User Language applications that maintain and report on data bases for IBM mainframe environments.

The program makes the user think in terms of tables, domains and constraints when creating data models or logical definitions.

The tables are made of columns, the columns are based on domains, and the domains are data elements. The constraints are rules that govern data integrity and data control for record addition, deletion and modification.

Automated Development Center is said to verify automatically the consistency between tables already specified in the data dictionary. Diagnostic messages explain how to make the tables and the end-user views of those tables consistent.

The tool allows the designer to add data elements, create tables and link them and data elements together. It also creates and displays dictionary documentation on the screen or prints it out in hard copy.

Automated Development Center is priced at $60,000. It runs in any IBM mainframe environment that can support Model 204.

Unitech releases system security for Unix-based units

Unitech Software, Inc. of Vienna, Va., has announced Usecure, a system security and administration product for Unix-based computers.

Usecure is a menu-driven program designed for nontechnical users. It is said to provide automated system access control and audit trails of system changes, file modifications, access permissions, deleted files and start-up and shutdown activity. It also offers file encryption capabilities and long-running commands can be executed in batch mode.

The program operates as a standard Unix application. Prices range from $300 on a micro to $2,500 on a mainframe.

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NEW PRODUCTS/SOFTWARE & SERVICES

SOFTWARE & SERVICES

Systems software

Tangram Systems Corp. has released **IIF Version 1.3**, an applications development facility that combines IBM's ISPF with SAS Institute, Inc.'s SAS software products.

IIF is said to integrate the SAS programming language into ISPF dialogues enabling dialogue developers to deliver complex interactive applications to end users. It optimizes the resources of ISPF and SAS and improves the responsiveness of SAS applications operating under ISPF.

IIF is available to installations that have IBM MVS/TSO, ISPF and SAS. A yearly license costs $2,500.

Tangram Systems, P.O. Box 5069, Cary, N.C. 27511.

Datatek Corp. has announced its **Vax Preprocessor** software package for newspaper library systems.

The Vax Preprocessor is a Digital Equipment Corp. VAX-based package said to replace the need for any editorial preprocessor interfaces, according to the vendor.

All users need is the ability to link the editorial system with the VAX hardware.

The package strips typeset code, performs translation and substitution of special characters, inserts context delimiters and break-line characters and formats the editorial information in an ASCII file readable by the Basis software from Battelle Laboratories.

The Vax Preprocessor is priced at $12,500.

Datatek, 818 N.W. 63rd St., Oklahoma City, Okla. 73116.

Comprehensive Software Design, Inc. has announced the **Physician's Management System** for medical practices, clinics or hospitals providing physician billing.

The program provides user-automated and forms billing, scheduling, statistics and financial modeling. Up to 99 separate groups with nine locations each can be accommodated.

It runs on the IBM System/36 and is written in RPG-II. The price ranges from $12,000 to $20,000.

Comprehensive Software Design, P.O. Box 749, 395 Washington, Brighton, Mich. 48116.

■

Computer Associates International, Inc. has announced **Release 5** of **CA-Jars** family, the firm's job accounting and reporting system, for MVS environments.

CA-Jars includes CA-Jars/OS, CA-Jars/CICS and CA-Jars/DSA. Enhancements include CA-Activator and new documentation. CA-Activator automates, controls and documents product installation, implementation and maintenance.

Prices for a three-year lease for CA-Jars/OS, CA-Jars/CICS and CA-Jars/OS with CA-Jars/DSA option are $14,000, $9,500 and $19,000, respectively.

Computer Associates International, 125 Jericho Tnpk., Jericho, N.Y. 11753.

■

Westmoreland Systems, Inc. has released **Version 4** of its **Application Design & Development System (ADD)** for the IBM System/36.

Version 4 is said to interface with IBM's data dictionary, IDDU. The user can update the ADD System Data Dictionary with data from IDDU or vice versa. The user also has the option of using either IDDU, the ADD System Data Dictionary or existing source members to retrieve file and field definitions when generating programs. With another added feature, up to seven screens can be generated for on-line inquiry and online file maintenance programs.

ADDS is priced at $3,500.

Westmoreland Systems, Suite 1, 278 Park Ave. N., Winter Park, Fla. 32790.

Applications packages

Sherrill-Lubinski has introduced the **Object-Oriented Graphical Modeling System**.

The program is composed of three integral components: the Graphical Modeling System Function Library of C function calls, the Graphical Modeling Language and Draw, a mouse-driven graphics editor.

The system is available on Digital Equipment Corp. VAX, IBM Personal Computer AT and Hewlett-Packard Co. computers. Prices range from $2,500 to $4,500.

Sherrill-Lubinski, Suite 110, 240 Tamal Vista Blvd., Corte Madera, Calif. 94925.

■

The Survey Research Center of the **Institute for Social Research** of the **University of Michigan** has announced **Osiris IV Release 9**.

Osiris IV is a data management and analysis package for IBM mainframes. Release 9 includes advanced statistics, tables, sampling error estimators and routines specifically useful for market segmentation, financial risk analysis and large-file data management.

Osiris IV is licensed at a cost of $4,000 for the first year and $2,500 for each succeeding year.

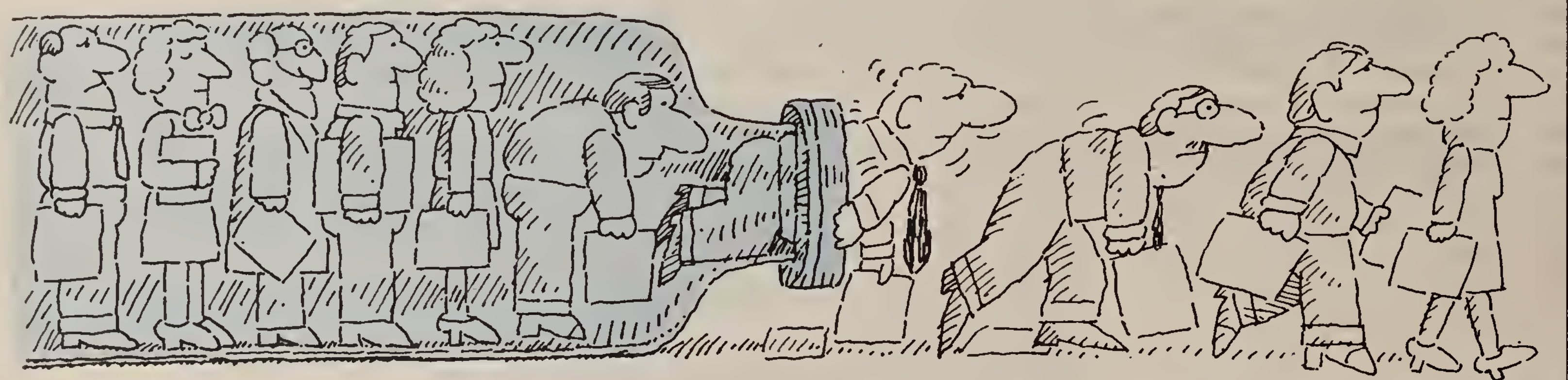
University of Michigan, Institute for Social Research, Box 1248, Department A, Ann Arbor, Mich. 48106.

■

Advacate Corp. has announced **For3000**, a forecasting system designed for the Hewlett-Packard Co. HP 3000.

For3000 can be used stand-alone or integrated into most inventory or order management systems. Features include forecasting horizontal, trend-

Continued on page 105



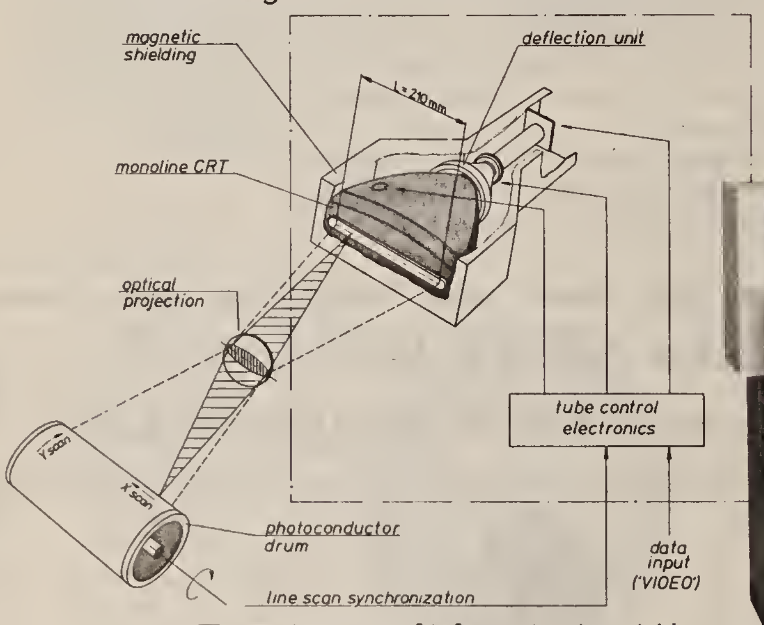
If the printer is the bottleneck in your office...

The Elpho 20 will provide the versatile, reliable solution.

It's ideal for clustered environments where time on a shared printer is at a premium and noise is an important consideration. It can produce 20 pages of letter-quality text and graphics per minute using plain paper.

The Elpho 20 features a specially developed CRT-projection technology for electrophotographic recording.

The input information is converted to optical signals. The light pattern is then projected on the surface to form an electrostatic image.



The entire page of information is quickly and crisply printed on plain paper.

The Philips CRT-projection technique has no moving parts for excellent reliability, extended use life, and variable resolution. And it is quiet—less than 50 dB.

Because we designed it to be used for practically all of your information processing requirements, we designed it with standard interfaces.

Elpho 20 print sample

Elpho 20 print sample

Elpho 20 print sample

Elpho 20 print sample

`Elpho 20 print sample`

Elpho 20 print sample

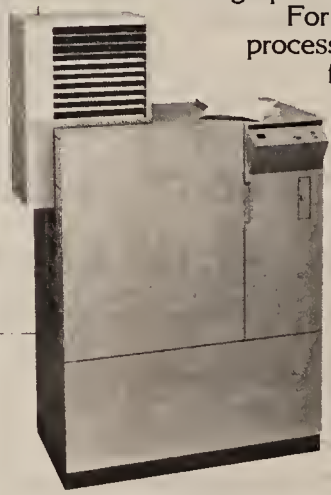
You can quickly and easily choose from a library of character sets. And you can change your character pitch, line spacings, and character renditions. The integral print control system even allows you to print multiple character fonts simultaneously.

All electronic modulation and line scan offer variable resolution between 200 and 600 dots per inch—both horizontally and vertically.

Because of the excellent resolutions, the Elpho 20 produces outstanding portrait and landscape printing as well as full graphics... including mixing text and graphics.

The Elpho 20 is ideal for data, text, and graphics printout.

For high-volume information processing printing functions, find out more about the one printer designed to meet all of your needs...the Elpho 20.



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- Selectable RS232C/RS422 bi-directional ports.
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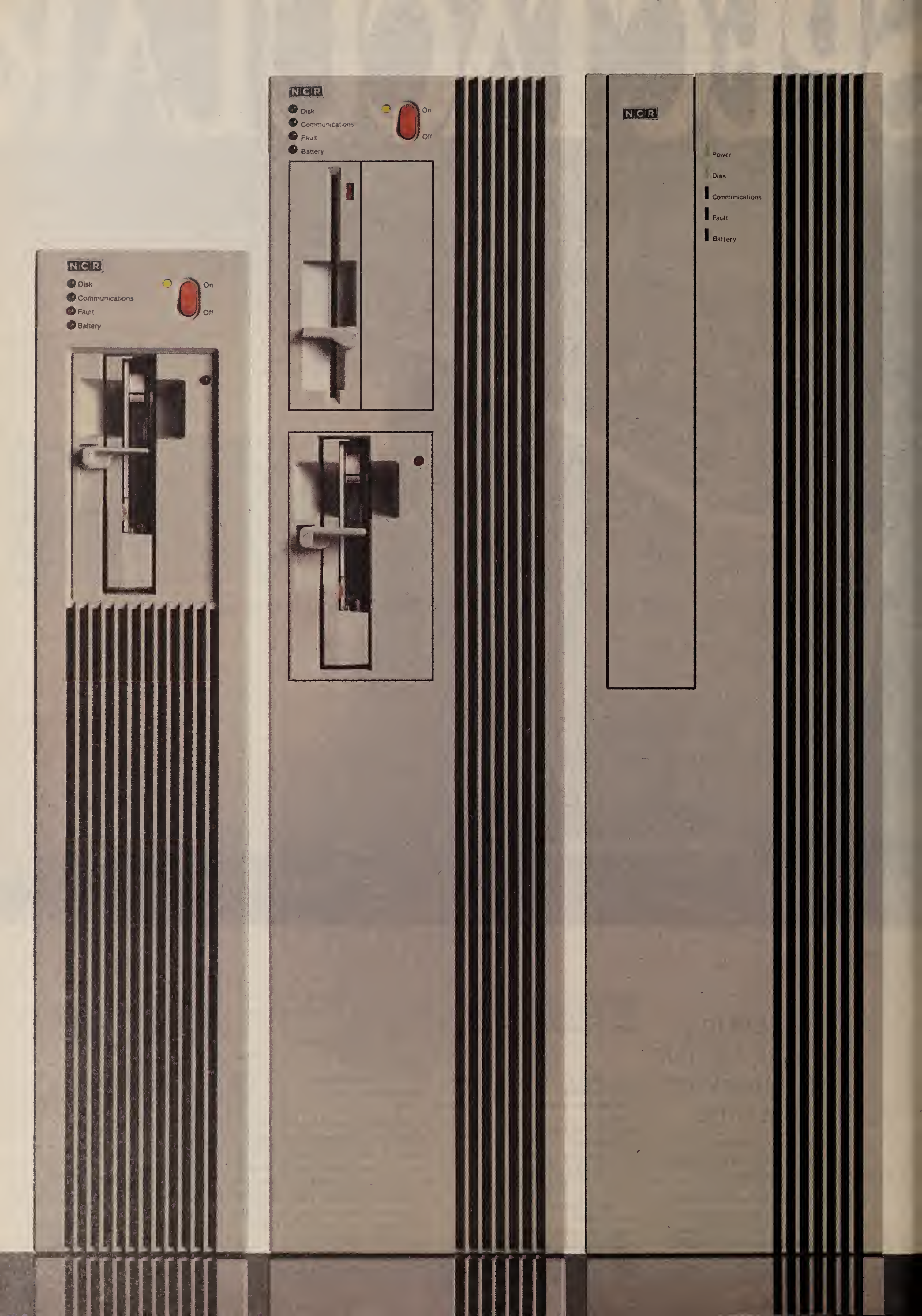
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Continued from page 100

ing, horizontal and seasonal and trending and seasonal demand patterns; optimum technique selection for each item or forecast element; and "what-if" modeling based on projections for product, product group, customer and geographical area.

For3000 costs $15,000.

Advacate, Suite 208, 7999 Knue Road, Indianapolis, Ind. 46250.

■

C. Abaci, Inc. has ported its **Scientific Desk** software program to the IBM RT Personal Computer.

The Desk is a problem-solving environment for mathematics and statistics. It contains a tool set consisting of a user interface with programs, documentation, tutorials and examples; a library, containing functions and subroutines designed to cover arithmetic, error analysis, special functions of mathematical physics, linear algebra, interpolation and solution of nonlinear equations; and problem solvers that require no programming and cover approximation, Eigensystem analysis, zeroes of polynomials and more.

The Desk costs $660. A site license costs $1,320.

C. Abaci, 208 St. Mary's St., Raleigh, N.C. 27605.

■

Target Systems Corp. has upgraded its **Target BBM** marketing software for Digital Equipment Corp. VAX computers running VMS.

Version 2 is said to provide the capability of targeting, executing and measuring advertising campaigns, lead response and direct marketing efforts. It also includes a Dun & Bradstreet Corp. data interface that allows users to access directly Dun & Bradstreet data files resident on their local system.

Target BBM, including data files, training and documentation, costs $9,500.

Target Systems, 33 Boston Post Road W., Marlboro, Mass. 01752.

Utilities

Syncsort, Inc. has announced **Release 2** of **Syback**, its backup/restore/copy utility for VM systems.

New features include an automatic tape pool management facility, a menu-driven full screen interface, a centralized restore utility and on-line Help.

According to the vendor, current Syback operations have been enhanced — for example, variable-length CMS files can now be copied along with fixed-length files. User exit capabilities have been expanded, as have tape-handling facilities.

Syback costs $9,000 for a three-year license.

Syncsort, CN18, 50 Tice Blvd., Woodcliff Lake, N.J. 07675.

■

Softouch Systems, Inc. has enhanced its **CICS-Windows** to provide support for the IBM Multiple Region Operation environment.

CICS-Windows is said to provide mainframe terminal users with the facilities to divide dynamically their existing CRT screen into windows for simultaneous initiating, displaying or updating of CICS transactions.

The enhancement allows users to have multiple CICS transactions, even those residing in different CICS regions, concurrently available on the same terminal.

The permanent license fee for CICS-Windows is $6,500 for DOS/VSE and $9,000 for OS/MVS/XA.

Softouch Systems, 8265 S. Walker, Oklahoma City, Okla. 73139.

■

XA Systems Corp. has added a series of VSAM extensions to its **Data-Xpert** data manipulation software.

The extensions are said to allow the Cobol application programmer to edit, browse, extract, reformat and print data from VSAM, ISAM, sequential or PDS files on-line under MVS/TSO/ISPF. Among the extensions are a VSAM file-allocation facility, support for all VSAM file types, the ability to apply selection criteria to VSAM files and the ability to browse VSAM files through a secondary index.

Data-Xpert costs $30,000.

XA Systems, 987 University Ave., Los Gatos, Calif. 95030.

■

Complete Software, Inc. has released **Cdebug Version 2**, a source-level debugger for C language programmers said to operate independently of host operating systems.

Cdebug, consisting of a preprocessor and a runtime library, shows all C objects according to their names and types and lets users set unlimited break and trace points by using regular expressions. It is said to provide full C support to Unix extensions.

Prices start at $350.

Complete Software, 60 Aberdeen Ave., Cambridge, Mass. 02138.

■

Metaphor Computer Systems, Inc. has announced the **Reporter**, a software tool for its Metaphor information retrieval and analysis system.

Reporter is said to enable users to retrieve and analyze information through the use of a single icon, producing the results in a custom-tailored report.

The Reporter may be added to existing Metaphor installations for $300 per workstation. A complete Metaphor Workstation Tool Set costs $1,500.

Metaphor, 1965 Charleston Road, Mountain View, Calif. 94043.

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Issco has released **Disspla Version 9.2** Fortran graphics subroutine library for the Control Data Corp. NOS V/E operating system and has announced its **Codebook** software option that provides scientific/engineering application prototypes for analysis, production and presentation graphics.

Disspla's graphics subroutines allow programmers to generate graphs, charts, maps, surfaces, contours and two- and three-dimensional designs, the vendor said.

Codebook provides a method for compiling Fortran code of the design features available in Disspla, according to Issco.

Disspla costs between $3,600 and $40,000.

The Codebook option, for IBM CMS and Digital Equipment Corp. VAX/VMS environments, ranges in cost between $900 and $9,800.

Issco, 10505 Sorrento Valley Road, San Diego, Calif. 92121.

Data base management systems

Contel Information Systems, Inc. has released **RTfile/VMS Version 2**, its relational data base management system for Digital Equipment Corp. VAX systems under VMS.

Version 2 is said to support data bases with up to two billion records.

According to the vendor, other enhancements include smaller images and faster runtimes as well as an improved sort interface and better performance with buffered I/O operations.

Documentation has been updated and expanded and program code has been refined.

Single-CPU, site and corporate licenses cost $5,000, $10,000 and $20,000, respectively, according to the vendor.

Contel Information Systems, 4330 E. West Highway, Bethesda, Md. 20814.

Training software

Crwth Computer Coursewares has released **Using Profs**, a computer-based training curriculum for users of IBM's Professional Office Systems (Profs).

The curriculum consists of four modules: the Profs Overview, Incoming Mail and the Mail Log, Calendar and Notes and Messages. The modules run on computer-based training presentation systems such as IBM's Interactive Instructional System or Interactive Instructional Presentation System, Goal System International, Inc.'s Phoenix or Boeing Computer Services Co.'s Scholar/Teach.

Using Profs' complete curriculum can be leased on a yearly license for $4,500.

Crwth Computer Coursewares, Suite 1804, 10880 Wilshire Blvd., Los Angeles, Calif. 90024.

■

IBM has announced the **Reports+ Training Edition**, a computer-based training package designed to introduce the Reports+ Edition of the IBM Personal Decision Series.

Reports+ Training Edition is an interactive educational workbook that runs on the IBM family of Personal Computers having IBM PC-DOS 2 or higher. The product is intended to teach the user to create a printed report with the Reports+ Edition. It features practice exercises and self-paced instruction.

The program is priced at $95.

IBM, Old Orchard Road, Armonk, N.Y. 10504.

Services

Syncsort, Inc. has announced the one-day **Syncsort OS Applications Workshop** to teach programmers working in an applications environment to use the Programmer Productivity Features of Syncsort OS.

The workshop includes student exercises, an applications workbook and other reference materials. It is presented at customer sites for $1,100.

Workshops, open to all Syncsort OS customers, are also scheduled at central locations. Upcoming workshops are scheduled in Cherry Hill, N.J., on Feb. 20; Tarrytown, N.Y., on Feb. 28; and New York on March 6. The fee for each attendee is $245.

Syncsort, Customer Education, 560 Sylvan Ave., Englewood Cliffs, N.J. 07632.

MICROCOMPUTERS

Systems

Unbound, Inc. has announced **Qube**, a transportable Digital Equipment Corp.-compatible system that features Micro/PDP-11/73 functionality.

Qube can be configured either as a micro tower or a personal computer-size desktop system. It consists of a four-slot, quad-height, 22-bit Q-bus backplane; 175W power supply; triple cooling fans; DEC RX50-compatible dual diskette drive; a Winchester disk drive with a formatted capacity of 22M bytes or 44M bytes; and a Mass Storage Control Protocol (MSCP)-compatible disk controller.

Prices for Qube begin at $6,500 for a system with a PDP-11/23 CPU, 256K bytes of random-access memory, dual RX50 floppy drive, a 22M-byte Winchester disk drive, MSCP controller and a four-channel serial interface.

Unbound, 15239 Springdale St., Huntington Beach, Calif. 92649.

■

Online Computer Systems, Inc., in conjunction with the R. R. Bowker Co. of New York and International Computaprint Corp. of Fort Washington, Pa., is offering a personal computer-based **Electronic Delivery Sys-**

YOU DON'T HAVE A COBOL PROGRAM SO PATCHED AND TANGLED IT CAN'T BE STRUCTURED AUTOMATICALLY.

Until recently, there were only two ways to deal with the patched-up, hand-me-down, unstructured COBOL programs that consume up to 70 percent of your company's software effort.

You could continue to live with the old programs, patching and mending as best you could. Or you could scrap the programs, at enormous cost and disruption, in favor of an entirely new system.

But now there is a third alternative. COBOL structuring. The advantages of this alternative are enormous. Among them, the ability to reduce maintenance costs by 50 percent by more effectively using your programming resources.

The technological leader in COBOL structuring is Language Technology, Inc. In fact, of the very few companies who claim to have a COBOL structuring solution at all, Language Technology is the only one with a system, called RECODER,™ that is fully automatic. The others automate only a portion of the structuring task, leaving the really tough parts to be done manually, over a period of weeks or more, by trained experts, who, because they are human, will make mistakes.

BENEFITS OF STRUCTURING

Source: T. Capers Jones	Unstructured	Completely Structured
Original program size (lines)	50,000	50,000
New code added (lines)	3,000	3,000
Programmer time (months)	12.5	6.5
Total cost	$75,000	$39,000
Defects at delivery	38	4
Stabilization period (weeks)	21	2
Meantime to failure (hours)	1.5	28

The benefits of structuring are illustrated in this example, representing the costs of adding 3000 lines of new code to an unstructured program of 50,000 lines, as compared to adding the same number of lines to the same size structured program.

Based on proprietary language processing techniques and pioneering research in graph theory, RECODER has reduced the tremendously complex mathematics involved to a provably correct solution so complete that it does not force you to accept its own style of structured code. You can select the level of nesting, type of operators, complexity of expressions, formatting style, representation of procedures, and many other features that might be required by your own in-house standards.

RECODER, available as a service or by license, can automatically structure thousands of lines of COBOL in minutes, without the necessity of adding

tem using compact disk read-only memory (CD-ROM) technology.

The base system, including an IBM Personal Computer-compatible unit with 512K bytes of memory, RS-232 communications, floppy diskette, monitor, CD-ROM with controller, printer and retrieval software, is priced from $3,000. IBM Personal Computer-based systems are priced from $4,000.

Online Computer Systems, 20251 Century Blvd., Germantown, Md. 20874.

■

Lomas Data Products, Inc. has introduced the **LDP-CAD Workstation**, a computer-aided design workstation that is compatible with IBM Personal Computers.

The LDP-CAD comes complete with an 8-MHz Intel Corp. 8086/8087 CPU; 512K bytes of random-access memory; IBM Personal Computer-compatible keyboard, video display and color monitor; 11-in. by 11-in. digitizer pad with 12-button cursor; and NV-Disk solid-state disk.

Prices range from $12,495 to $19,995.

Lomas Data Products, 182 Cedar Hill St., Marlboro, Mass. 01752.

■

Caetec Systems, Inc. has announced the **Pro-One**, **Pro-Two** and **Pro-Three** turnkey mechanical engineering-oriented systems.

Each system consists of an enhanced IBM Personal Computer AT, high-resolution color monitor, plotter, design and analysis software, training and installation. The Pro-Series family is centered on a three-dimensional solids modeler and a universal 3-D data base.

The Pro-One is a mechanical engineering workstation and costs $30,400. The Pro-Two is for finite element modeling and analysis and costs $25,400. The Pro-Three is forge-oriented and costs $26,800.

Caetec Systems, Suite 130, 1 Dunwoody Park, Atlanta, Ga. 30338.

■

New Media Graphics Corp. has announced the **EECO VAC-300 decoder**, a still-frame audio option for its PC-Graphover interactive videodisk/graphics system.

The decoder utilizes an analog decoding technique to recover high-density audio from National Television Standard Code video frames of a laser videodisk. Up to 10 seconds of still-frame audio per video frame can be generated.

The total system incorporates an IBM Personal Computer, Personal Computer XT or AT with the PC-Graphover controlling the playback from the videodisk player.

PC-Graphover costs $1,990. The decoder option costs $3,000.

New Media Graphics, 279 Cambridge St., Burlington, Mass. 01803.

■

Daisywordpro, Inc. has introduced a **secretarial workstation** said to incorporate the ease of a standard typewriter with the capabilities of a dedicated word processor.

The workstation fits on the return section of a secretary's desk. Features include a 12-in., 132-col. by 25-line amber screen; a keyboard with a standard typewriter array of 50 alphanumeric keys, a 15-key numeric keypad and 47 English-labeled function keys; two 5¼-in. floppy disk drives; a 200-word per minute, 132-col. width daisywheel printer; and an RS-232 communciations port.

The system costs $1,995.

Daisywordpro, 15162 Golden West Circle, Westminster, Calif. 92683.

■

R-Micro Corp. has unveiled **RC500**, a computerized point-of-sale system for specialty stores.

With each transaction inventory, RC500 automatically updates accounts receivable and payable, sales analysis and general ledger files stored on a hard disk. Data entry screens prompt cashiers for information as they enter numerical transaction data via a standard 10-key pad.

Other features include IBM Personal Computer compatibility, 256K bytes of memory expandable to 640K bytes, a 10M-byte hard disk, five slots for computer expansion cards, a parallel printer port and a serial terminal port.

RC500 costs about $8,000.

R-Micro, 360 Alexander St., Rochester, N.Y. 14607.

Software applications packages

National Software Enterprises, Inc. has introduced **NSE-Demo Maker**, a software product designed to capture screen images on IBM Personal Computers.

NSE-Demo Maker allows users to save screens from any application, to edit saved screens, to create new screens, to demonstrate an application's features without running the program and to create demonstrations that can run on color or monochrome monitors.

NSE-Demo Maker costs $125.

National Software Enterprises, Suite C-210, 3260 Powers Ferry Road, Marietta, Ga. 30067.

■

The Software Group has announced **Enable/Check**, a separately packaged spelling checker designed to work with the Enable integrated microsoftware system.

Enable/Check is based on the 80,000-word Proximity/Merriam-Webster Linguibase and will automatically detect and correct misspelled, duplicated or improperly

Continued on page 108

consultants or any new people to your staff or of requiring any new skills of the people already on it. And, RECODER can do it with a cost effectiveness that will allow it to pay for itself within a year.

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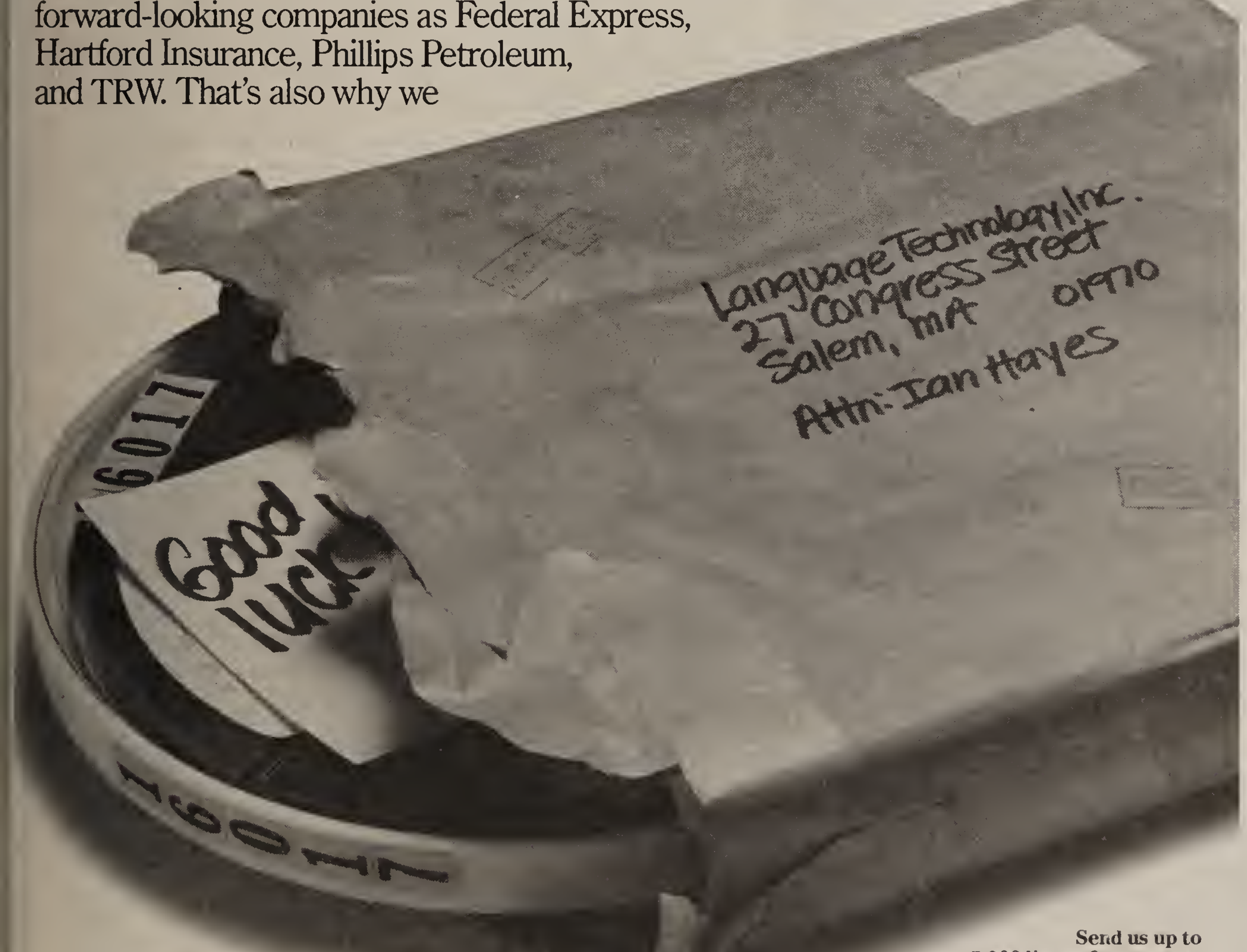

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NEW PRODUCTS/MICROCOMPUTERS

Continued from page 107

abbreviated words.

Enable/Check costs $34.95. It will be sent free of charge to Enable users who subscribe to the company's annual support plan.

The Software Group, Northway Ten Executive Park, Ballston Lake, New York, N.Y. 12019.

■

Silton-Bookman Systems, Inc. has released **Training Department Accountant**, designed to automate training program budgeting, cost tracking, expense forecasting and inventory management.

Training Department Accountant builds training program budgets. Users can track all cost items and request a summary of expenses by cost item by training program, by major cost category, by cost center or by time period. The program also allows users to monitor changes throughout the year.

Training Department Accountant cost $795.

Silton-Bookman Systems, Suite 222, 4966 El Camino Real, Los Altos, Calif. 94022.

■

Janus Associates has announced **Laser Print Plus**, a desktop publishing version of its Laser Print software product.

Laser Print Plus enables users to do typesetting and graphics on an IBM Personal Computer with Hewlett-Packard Co. or Canon U.S.A., Inc. laser printers. The software creates documents, forms, newsletters and labels. It supports all laser printer features, provides for elecronic cut and paste and has built-in graphics capabilities that enable users to create free-form graphics.

Laser Print Plus costs $395.

Janus Associates, Suite 1, 991 Massachusetts Ave., Cambridge, Mass. 02138.

■

Vision Enterprises, Inc. has announced a **software package** developed by Educational Electronic Techniques for the testing and treatment of persons with Alzheimer's disease, stroke and related disabilities.

The package runs on the Apple Computer, Inc. Apple II, Apple II+ and Apple IIe and uses light-pen technology.

The basic software package is priced at $650.

Vision Enterprises, P.O. Box 841, Elk Grove Village, Ill. 60007.

■

Gold Hill Computers, Inc. has released the **GCLISP 286 Developer**, an artificial intelligence development system for the IBM Personal Computer AT and compatibles.

The product includes a memory interpreter and compiler, editor, tutorial and on-line Help system. It requires an AT with 2M bytes or more of memory, IBM PC-DOS 3 or higher, one double-sided, double-density or quad-density diskette drive and a hard disk.

The GCLISP 286 Developer costs $1,195.

Gold Hill Computers, 163 Harvard Ave., Cambridge, Mass. 02139.

■

Financial Decision Systems, Inc. has unveiled the **Corptax State Planner**, an applications package for state tax estimating and planning.

The software uses a data base that contains apportionment and taxable income information and includes cor-

Continued on page 110

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Lil'Net may be hard to top.
But we've got all this winter to try.

Develcon
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Continued from page 108

porate state income tax rates and apportionment methods.

Features include the abilities to track overpayment credits and payments, to implement adjustments by jurisdiction or income item and to merge data to plan for the tax effect of mergers or dispositions.

The package requires a 512K-byte IBM Personal Computer with one hard disk. It costs $795.

Financial Decision Systems, 28035 Dorothy Drive, Agoura Hills, Calif. 91301.

■

Enertronics Research, Inc. has announced **Enercharts**, a presentation graphics system said to provide two- and three-dimensional charts and the ability to merge up to four graphics files on one screen.

The package provides pie, bar and line charts; high/low close bar and line charts; text charts with up to eight fonts; Gantt charts; and scatter graphs.

Enercharts runs on an IBM Enhanced Graphics Adapter in the color or monochrome mode and full screen on the 3270 Personal Computer or Hercules Computer Technology Co. monochrome adapter.

Enercharts costs $395.

Enertronics Research, Suite 207, 150 N. Meramec, St. Louis, Mo. 63105.

■

Excel Software has offered **Structure Chart**, a program for building working blueprints of large-scale software systems.

The package lets users graphically illustrate the organization and connection of a program's software modules, including procedures, functions and subroutines. A description window describes each module's interface, function and design.

The package contains a graphics editor and text editor offering features such as cut, paste, copy, search, replace and move for any graphics or text selection.

Requiring a 512K-byte Apple Computer, Inc. Macintosh and a printer, Structure Chart is priced at $449.

Excel Software, P.O. Box 1414, Marshalltown, Iowa 50158.

■

ASM Software has announced **Enplot**, an interactive engineering graphics package said to offer nonlinear regression analysis capabilities and a data base management system for the IBM Personal Computer family.

Enplot handles up to 400,000 data points and uses pop-up menus for creating, using and modifying data base graph files.

The product will accept data from keyed input or existing data files in either ASCII or IBM Data Interchange Format.

Other features include log-to-log scales, automatic scale conversions, zoom capabilities, multiple overlays plus independent primary and secondary scales.

The software sells for $390.

ASM Software, American Society for Metals, Metals Park, Ohio 44073.

Auto Tax Saver, a package that maintains records that are necessary for deducting expenses related to business use of automobiles, has been introduced by **Adaptive Software**.

The software reportedly provides the necessary documentation required by the Internal Revenue Service to show mileage for each business use plus total annual mileage.

Auto Tax Saver is said to track the percentage of business use and compares the result with figures for the prior year.

According to Adaptive Software, mileage totals appear by day, month and year to date.

The software package runs on IBM Personal Computers and compatible microcomputers with 192K bytes of memory and is priced at $49.

Adaptive Software, 1868 Cavell Ave., Highland Park, Ill. 60035.

Haran Software Systems is offering **Swiftform**, a software program that automatically fills out preprinted forms without requiring end users to design a screen layout.

Swiftform is said to build an image of the form on the screen when users enter the positions of blanks in the form via a grid of numbered rows and columns.

Data entry features are said to include automatic word wrap, paragraph refor-

matting, automatic calculations and numeric entry formatting.

Entered data can be searched and sorted and imported from and exported to other programs, according to the vendor.

Swiftform, for IBM Personal Computers and compatible microcomputers, costs $195.

Haran Software Systems, Suite 111, Department 143, 31858 Alvarado Blvd., Union City, Calif. 94587.

Job Cost, job-costing software for contractors and job shops was unveiled by **Realworld Corp.**

The package can run as a stand-alone system or integrated with other accounting software from the vendor, including general ledger, receivables, payables, payroll and inventory control applications.

The program runs on IBM Personal Computers, Personal Computer XTs, ATs or compatibles configured with at least 192K bytes of memory, a hard disk and Microsoft Corp. MS-DOS 2 or higher.

Job Cost costs $695, the vendor said.

Realworld, Dover Road, Chichester, N.H. 03263.

Software languages

The WSM Group, Inc. has released its full C compiler, **Hyper C 68000**, for Apple Computer, Inc.'s Macintosh computer.

The compiler includes bit fields, as well as extensions, said to allow simple interfacing to the Macintosh ROM Toolbox routines. Toolbox calls are generated in-line with the rest of the C code. Pascal functions can also be coded in-line.

Hyper C is an optimizing compiler that generates 68000 assembly language source.

Hyper C costs $199.95, including documentation, C preprocessor, compiler, 68000 assembler, intelligent linker, librarian utility, library routines and Toolbox interface header files.

The WSM Group, Suite 241, 1161 N. El Dorado Place, Tucson, Ariz. 85715.

■

Apple Computer, Inc. has upgraded **Apple II Pascal** to support Unidisk 3.5, its 3½-in. floppy disk drive said to increase Apple II storage capacity to 800K bytes.

Version 1.3 is said to allow end users to format a 3½-in. disk from within the Pascal operating system and to create larger programs without having to access multiple disks.

The product includes the language on a 3½-in. format that fits on a single diskette, and a 5¼-in. format that requires four diskettes to store the Pascal system, according to the vendor.

The version of Apple II Pascal runs on Apple II Plus, Apple IIe or Apple IIc personal computers with at least 64K bytes of internal memory. The product sells for $250.

Apple Computer, 20525 Mariani Ave., Cupertino, Calif. 95014.

Software utilities

Verticom Inc. and **Grafpoint** have announced a hardware/software package said to allow a personal computer to emulate fully a Tektronix, Inc. 4107 model or 4109 model color graphics terminal.

The Verticom graphics subsystem coupled with Grafpoint's Tgraf-07 software is said to provide the compatibility bridge to mainframe-based engineering packages such as Manufacturing and Consulting Services, Inc.'s Anvil-4000, Swanson Analysis Systems, Inc.'s Ansys, Tektronix's Plot-10 as well as Issco's Tell-A-Graf and SAS Institute, Inc.'s SAS/Graph.

The Tektronix emulation package ranges in price from $4,000 to $6,000, the vendor said.

Verticom, 545 Weddell Drive, Sunnyvale, Calif. 94089.

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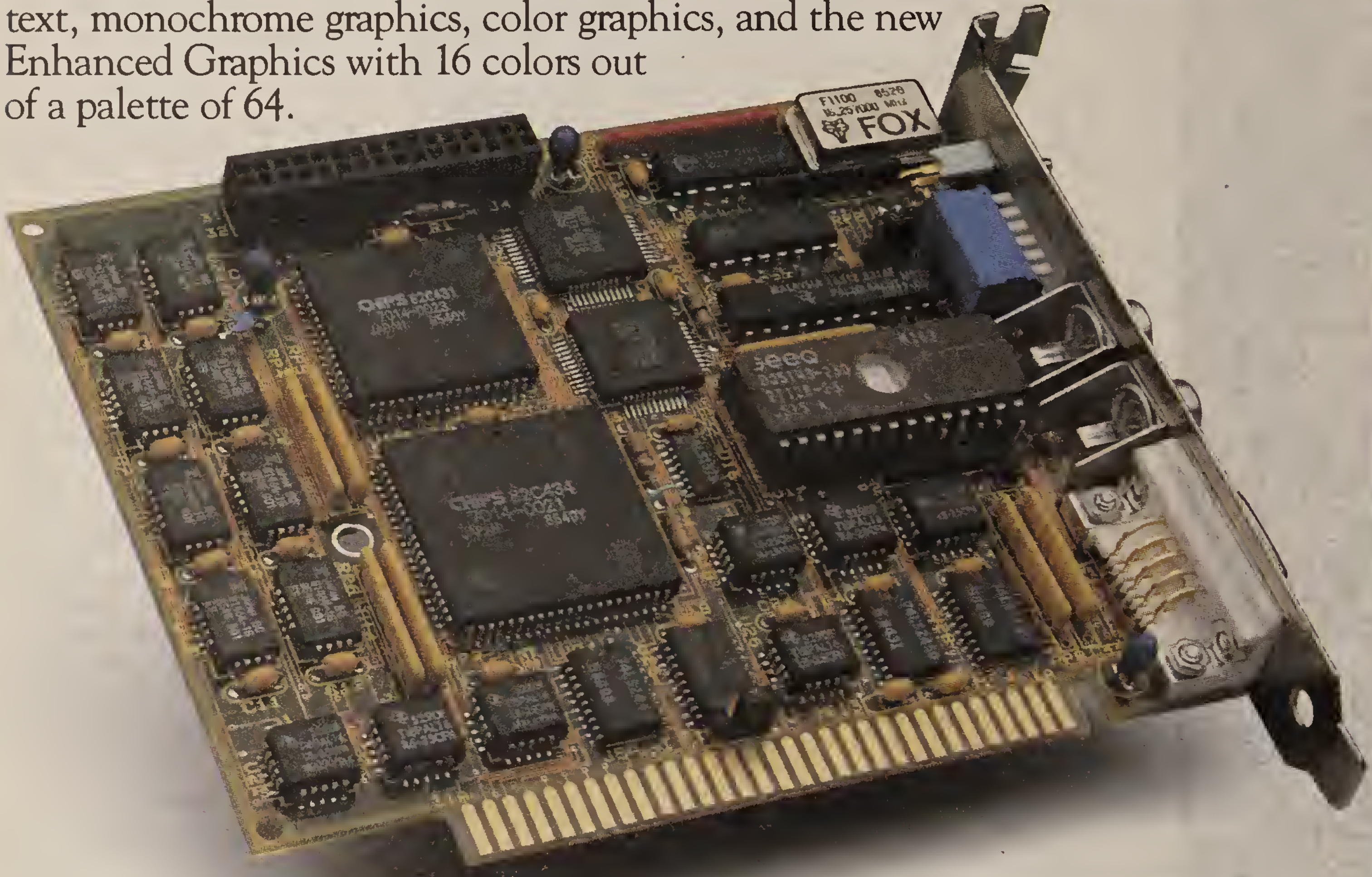

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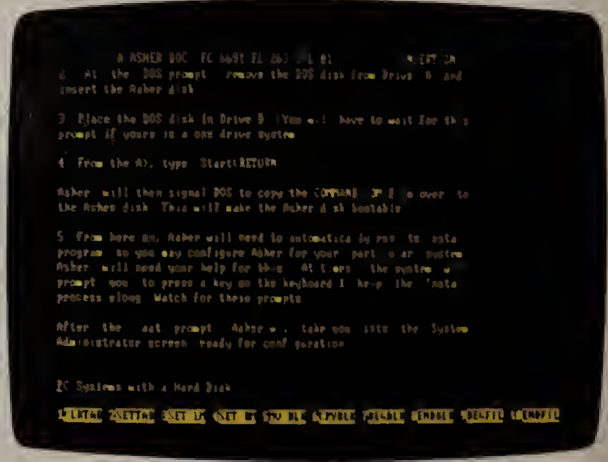

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NEW PRODUCTS/MICROCOMPUTERS

Versatec, Inc. and **National Instruments** have announced the **Versaplot 9/Gpib-PC** software support package designed to convert the user's pen plotter calls to vector files and then to raster control inputs for the Versatec V-80 series of electrostatic plotters.

The software runs on an IBM Personal Computer or compatible equipped with a National Instruments Gpib-PC IEEE 488 interface card, a software handler and an IEEE 488 cable that connects the personal computer to the plotter.

The Versaplot 9/Gpib-PC is priced at $1,000.

National Instruments, 12109 Technology Blvd., Austin, Texas 78727.

■

Western Union Corp. has announced **Instant Forms Plus**, a package of software utility programs said to enable users of the vendor's Easylink service to create, modify and transmit electronic business forms.

Instant Forms Plus was designed for IBM Personal Computers and compatibles. The package lets users custom design business forms and send them via Easylink to other offices, according to the vendor.

Instant Forms Plus reportedly features six other standalone software utilities: a conversion utility for changing binary files into ASCII files, a split utility, a concatenate utility, the off-line printing utility, a flip CRT utility and a purge utility.

Instant Forms Plus costs $100.

Western Union, One Lake St., Upper Saddle River, N.J. 07458.

■

Persoft, Inc. has introduced **Smarterm 240**, a terminal emulation software package.

Smarterm 240 is said to offer Tektronix, Inc. graphics terminal emulation for the computer-aided design and manufacturing user, Digital Equipment Corp. Regis graphics emulation for the business graphics users and DEC VT220 series text terminal emulation for access to host software.

In addition, Smarterm 240 reportedly offers data transfer and includes error-checking file transfer protocols. Smarterm 240 features pop-up windows.

Smarterm 240 runs under Version 2 or later of the IBM PC-DOS operating system. It costs $295.

Persoft, 2740 Ski Lane, Madison, Wis. 53713.

■

Windsor Technologies, Inc. has released **Version 1.06** of its **PC-Technician**, a diagnostic product for the IBM Personal Computer and Personal Computer XT.

PC-Technician is said to perform diagnostic tests on the overall microcomputer system's hardware and software and in-depth testing of each individual system component. Components tested include the system board, random-access memory, diskette drive control board and drive, keyboard, serial port and parallel printer port.

The PC-Technician is priced at $200.

Windsor Technologies, Suite 380, 66 Bouvet Road, San Mateo, Calif. 94402.

■

Wendin, Inc. has unveiled **PC Unix**, a Unix-type operating system for the IBM Personal Computer, Personal Computer XT, AT and compatible microcomputers. The system offers a multiuser programming environment with multiple processes, systems services and 30 utility programs.

PC Unix runs Microsoft Corp. MS-DOS and IBM PC-DOS programs without modification. It reportedly uses multitasking to manage concurrent access to files and to interface with computers running the vendor's other operating systems.

Including manuals and source code, PC Unix sells for $99.

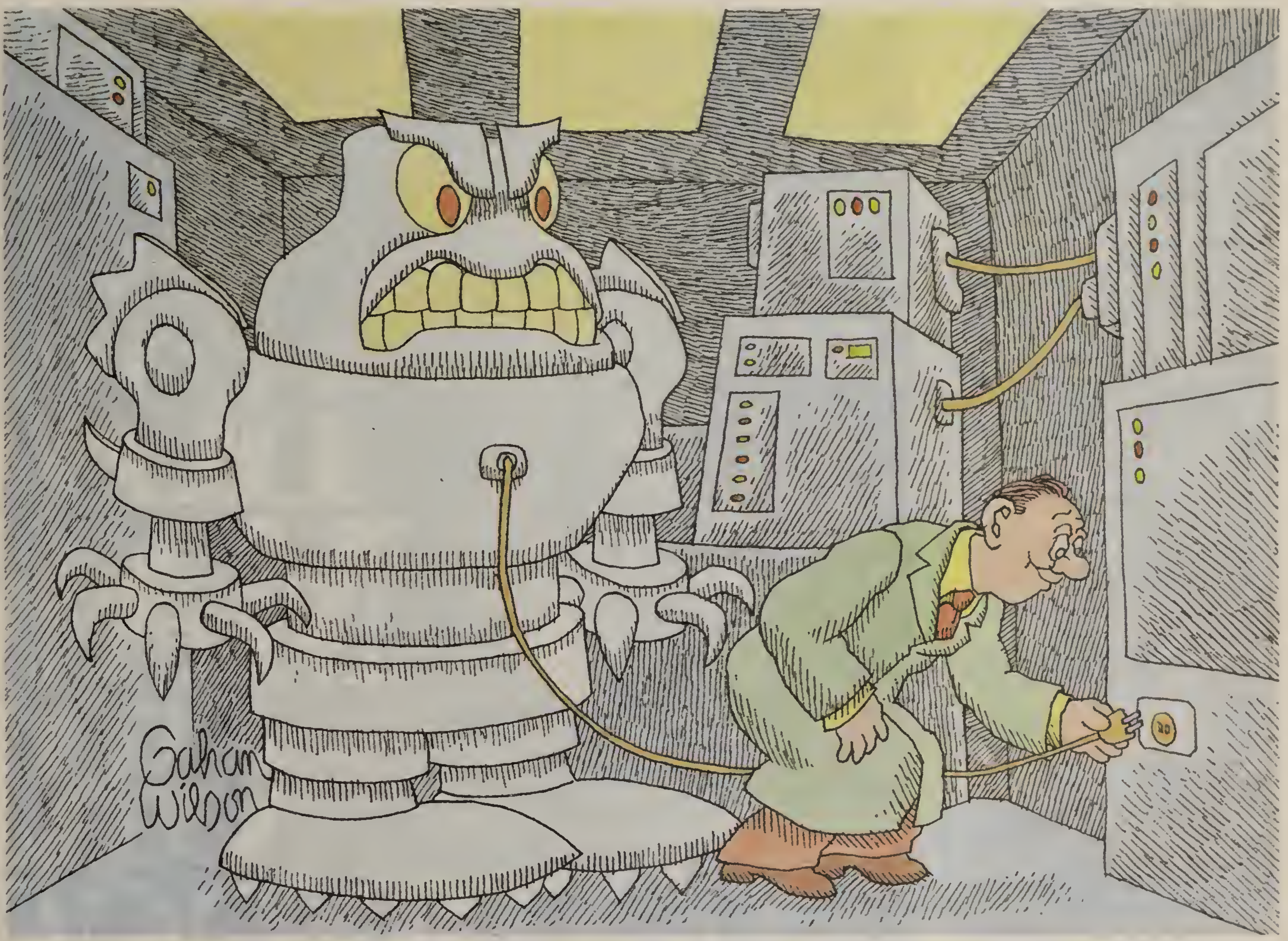
Wendin, Box 266, Cheney, Wash. 99004.

■

Rainbow Technologies, Inc. has released a **Xenix version** of its **Software Sentinel** hardware key system for preventing unauthorized access to software programs.

The Xenix version provides software publishers and developers with a system of locks. Software Sentinel uses a proprietary encryption algorithm. The locks are defined by the software developer and implemented as part of the appli-

Continued on page 114



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Continued from page 113

cation program.

Purchased in quantities, Software Sentinel costs $35. An evaluation kit is available for a security deposit of $250.

Rainbow Technologies, Suite F, 17971 Skypark Circle, Irvine, Calif. 92714.

■

The **Concurrent Support Tool**, which reportedly lets users develop microcomputer training, on-line reference aids and tutorials without the need to simulate application software, is offered by **Vasco.**

The software uses concurrency to allow it to run at the same time as the subject software, eliminating the need to build simulations.

A minimum system configuration is an IBM Personal Computer, Personal Computer XT, AT or compatible with 512K bytes of memory, a color monitor, color graphics adapter and hard disk drive.

The product costs $795.

Vasco, Suite 118-C, 1919 S. Highland Ave., Lombard, Ill. 60148.

■

Softdesign, Inc. is offering **Maclightning,** a random-access-memory resident package for the Apple Computer, Inc. Macintosh that allows users to access and manipulate multiple data libraries and reference works.

Maclightning is a spelling and grammar checker. Additional reference libraries will reportedly include encyclopedias; technical dictionaries; and medical, legal and scientific references.

The package can check an average of 43 word/sec. The user can correct errors within a document and add words to the dictionary.

Maclightning includes a 31,000-word dictionary and built-in grammar checker.

The product costs $99.95.

Softdesign, 14206 S.W. 136th St., Miami, Fla. 33186.

■

Point Control Co. has announced **Smartcam,** a computerized numerical control programming system for the IBM family of Personal Computers and the Apple Computer, Inc. Apple II series.

Smartcam displays tools and the tool path, allowing users to edit the path. Graphics features include group copy, rotate, image and scale for modifying or nesting parts, plus tool sorting, automatic blend radius and zoom for viewing image details. Users can also edit existing part programs and communicate with tape punch/readers or computerized numerical control via an RS-232 interface.

Prices are $2,995 for Microsoft Corp. MS-DOS computers and $1,995 for Apple II series processors.

Point Control, Suite 6, 372 W. 12th Ave., Eugene, Ore. 97401.

■

Sophco, Inc. has unwrapped **Sybil,** utilities for recovering accidentally formatted hard disks.

Designed to respond to paths and DOS wild cards, Sybil is said to recover erased files, edit sectors, modify file and directory attributes and find files. In addition, the utility package performs the same functions as IBM's Advanced Diagnostics Diskette, including hard format of hard disks and ability to test system boards, memory, keyboards, ports and video.

Sybil also comes with a print spooler, random-access memory disk, general regulation expression parser and graphics editor.

Sybil costs $49.95.

Sophco, P.O. Box 7430, Boulder, Colo. 80306.

Software data base management systems

Provue Development Corp. has added two templates, **Overvue Mail Manager** and **Overvue Personal Finance**, to Overvue, its relational data base package for the Apple Computer, Inc. Macintosh.

Each template provides predesigned macros, report formats, charts and relation files that set up Overvue to function as a special-purpose program.

Mail Manager allows users to manage mailing lists. Personal Finance allows users to budget and track personal financial transactions, the vendor said.

The templates cost $39.95 each.

Provue Development, 222 22nd St., Huntington Beach, Calif. 92648.

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IMPRESSION
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OFFICE

PG02520

CADrover, a graphics data base software package for users of microprocessor-based computer-aided design systems, has debuted from **Micro-Vector, Inc.**

Designed for organizing drawings within its own visual data base, it allows users selective random access to desired drawings for query and display sequences.

The package also links graphics with nongraphics information and supports most display, mouse and digitizer devices.

CADrover runs on an IBM Personal Computer. It lists for $495.

Micro-Vector, 1 Byram Brook Place, Armonk, N.Y. 10504.

■

Security Pacific Computer Solutions, Inc. has announced **Lead Manager**, a program for data bases said to assist marketing professionals in serving and tracking sales leads.

It builds and stores a data base of prospect information and updates the records when each contact is made. Users can retrieve information according to recurring fields in prospect records.

Lead Manager prints labels, envelopes and reports. It runs on an IBM Personal Computer, Personal Computer XT, AT or compatible with 128K bytes of memory and two floppy disk drives.

Lead Manager costs $295.

Security Pacific Computer Solutions, Suite 100, 350 S. Figueroa St., Los Angeles, Calif. 90071.

■

Comufirm Corp. has announced the **Data Base Manager**, a data base management system for Microsoft Corp. MS-DOS-based or IBM PC-DOS-, Irmx-86- and RTX-based microcomputers.

The Data Base Manager uses an indexed sequential access method for locating and retrieving data records. Users reportedly can configure the program by defining the memory model, the size of keys and the number of open data bases. It may also be configured as a task for Irmx-86 and RTX operating systems.

The Data Base Manager sells for $495.

Compufirm, 7677 Ronson Road, San Diego, Calif. 92111.

■

Data Basic Plus, a data base file handler that interfaces to Basic language programs for IBM PC-DOS has bowed from **Tominy, Inc.**

Data Basic Plus provides keyed file access to Basic programmers, the vendor said. It offers the ability to create a data base, functional data base analysis, maintenance capability plus backup and restore utilities.

Data Basic Plus retails for $99.95.

Tominy, 4221 Malsbary Road, Cincinnati, Ohio 45242.

Software enhancements

Joseph A. Vincent Consulting has released **Version 2 of B-B-Face**, its Btrieve/Better Basic interface.

Version 2 is said to allow Better Basic programmers to use both Better Basic structures and simple strings as Btrieve records.

B-B-Face is an optimized assembly code interface between Better Basic and the Btrieve Record Manager.

B-B-Face requires Better Basic, Btrieve and IBM PC-DOS or Microsoft Corp. MS-DOS 2 or later, according to the vendor. It costs $49.95.

Joseph A. Vincent Consulting, 805 Pine Way, Anchorage, Ky. 40223.

■

Summit Software Technology, Inc. has upgraded its **Better Basic** programming language.

Version 2 is said to be completely compatible with traditional Basic languages. Another feature is its interactive edit capability that allows programmers to change the type of variables and the size of fixed strings.

Better Basic 2, including documentation, costs $199. Registered users of the earlier version can upgrade for $50. The optional Runtime System costs $250.

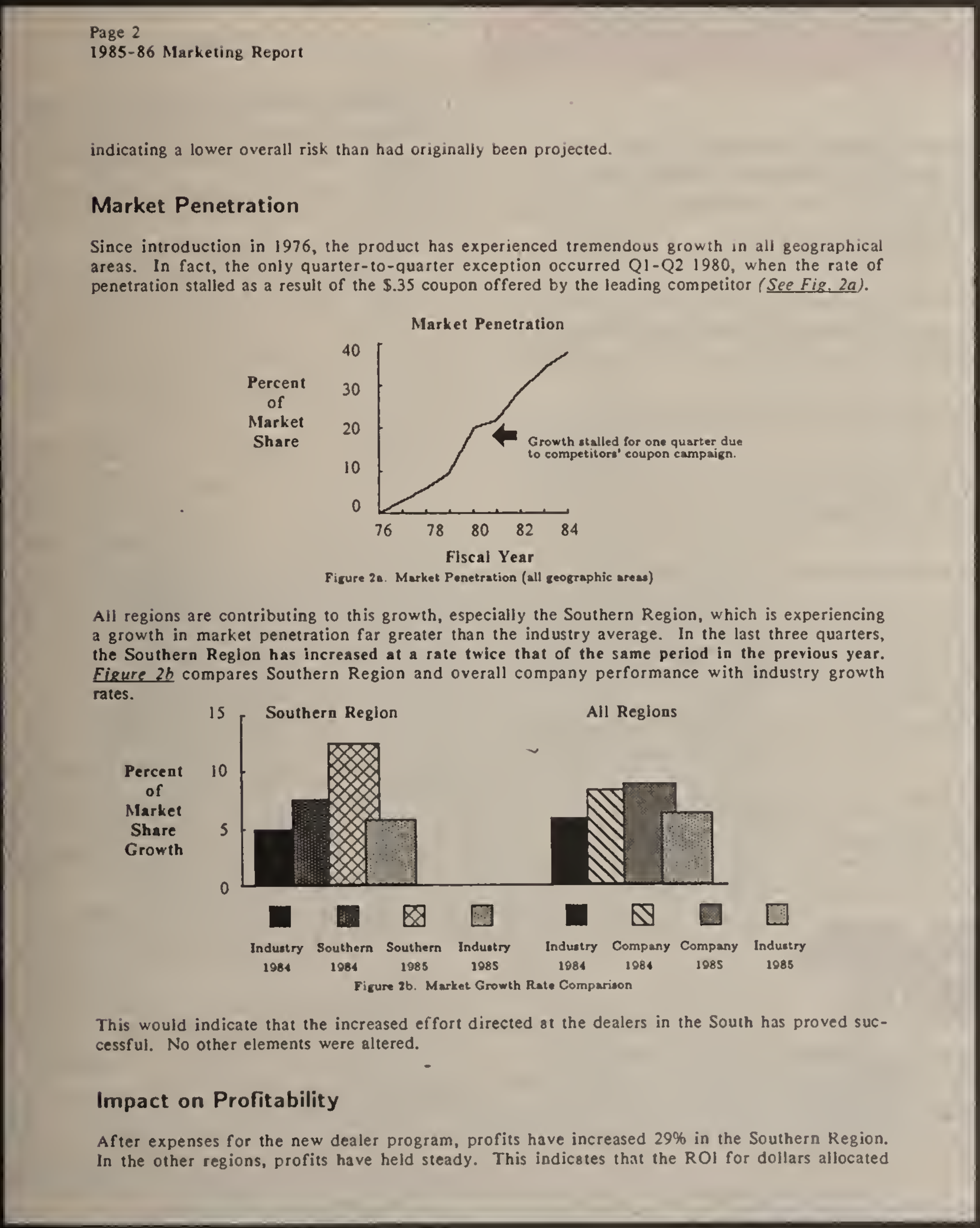
Summit Software Technology, 106 Access Road, Norwood, Mass. 02062.

■

Softel, Inc. has released a version of its **Videogram 3** freehand color graphics program for the IBM Enhanced Graphics Adapter for the

Continued on page 116

With the Hewlett-Packard LaserJet Printer.


Market Penetration
Percent of Market Share
40
30
20
10
0
76
78
80
82
84
Fiscal Year
Growth stalled for one quarter due to competitors' coupon campaign.
15
10
5
0
Southern Region
All Regions
Percent of Market Share Growth
Industry 1984
Southern 1984
Southern 1985
Industry 1985
Industry 1984
Company 1984
Company 1985
Industry 1985

Page 2
1985-86 Marketing Report

indicating a lower overall risk than had originally been projected.

Market Penetration

Since introduction in 1976, the product has experienced tremendous growth in all geographical areas. In fact, the only quarter-to-quarter exception occurred Q1-Q2 1980, when the rate of penetration stalled as a result of the $.35 coupon offered by the leading competitor *(See Fig. 2a)*.

Figure 2a. Market Penetration (all geographic areas)

All regions are contributing to this growth, especially the Southern Region, which is experiencing a growth in market penetration far greater than the industry average. In the last three quarters, the Southern Region has increased at a rate twice that of the same period in the previous year. *Figure 2b* compares Southern Region and overall company performance with industry growth rates.

Figure 2b. Market Growth Rate Comparison

This would indicate that the increased effort directed at the dealers in the South has proved successful. No other elements were altered.

Impact on Profitability

After expenses for the new dealer program, profits have increased 29% in the Southern Region. In the other regions, profits have held steady. This indicates that the ROI for dollars allocated

Configuration requirements: IBM PC or compatible, HP LaserJet Printer, HP 92286F font cartridge, Microsoft Chart,™ WordStar™ and Polaris PrintMerge.™ Polaris Software, San Diego, California. (619) 471-0922. Microsoft Chart is a registered trademark of Microsoft Corporation. WordStar is a registered trademark of MicroPro International. Polaris PrintMerge is a registered trademark of Polaris Software.

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NEW PRODUCTS/MICROCOMPUTERS

Continued from page 115

AT&T Display Enhancement Board.

The release gives users the ability to move picture files from the IBM Personal Computer environment to the AT&T PC 6300 environment or vice versa. In the AT&T environment, users may select any 16 of 256 colors at 640- by 400-dot resolution.

Videogram costs $200. When bundled with all the equipment necessary to produce instant 35mm slides, it costs $875.

Softel, Box 1230, Keene, N.H. 03431.

■

Softshell Corp. has released Version 3 of its **3-by-5 information management programs**.

The programs, 3-by-5 Starter Kit, 3-by-5, 3-by-5 Plus, 3-by-5 Legal and 3-by-5 Technical Manual, are said to offer speed, simplicity and versatility in entering, indexing and retrieving free-text and structured data.

Starter Kit is available free on diskette. With a manual, it costs $10.95. The 3-by-5 program costs $49.95, and 3-by-5 Plus costs $69.95. The 3-by-5 Legal product costs $89.95; 3-by-5 Technical Manual costs $29.95, the vendor said.

Softshell, P.O. Box 649, Bel Air, Md. 21014.

■

Itek Composition Systems has announced two enhancements to its **Personal Typesetting Workstation** publishing software package for the IBM Personal Computer.

The document style capability allows users to produce consistently formatted documents for typesetting by using tags to identify each piece of copy in need of formatting.

The typewriter tabbing capability simulates an electric typewriter, allowing the user to watch a table taking shape on the screen.

Personal Typesetting Workstation costs $2,000 to $5,000. The Digitek 4000 typesetter costs $18,000.

Itek Composition Systems, 34 Cellu Drive, Nashua, N.H. 03063.

■

Microsoft Corp. has enhanced its **Multiplan** spreadsheet for the Apple Computer, Inc. Macintosh by adding printing options, financial functions, variable fonts and font sizes and a second spreadsheet window.

Multiplan Version 1.1 spreadsheets can be printed in ASCII mode allowing faster printing of drafts. Added financial functions include internal rate of return, modified internal rate of return, present value, future value, payment, number of periods and rate.

Multiplan Version 1.1, which runs on either a 128K-byte or 512K-byte Macintosh, retails for $195.

Microsoft, Customer Service Department, Box 97200, 10700 Northup Way, Bellevue, Wash. 98009.

■

Brooks Scientific, Inc. has enhanced **PCtran Plus**, its interactive graphics engineering software for the IBM Personal Computer XT, AT and compatibles, by adding an equation solver said to analyze problems of unlimited size.

The upgrade provides a modular structure and graphics display capabilities including solid color fills, color contouring, windowing and three-dimensional viewing.

The base module, priced at $1,295, consists of interactive graphics preprocessing, postprocessing and static stress analysis. Add-on modules are available for $700 each.

Brooks Scientific, 55 Wheeler St., Cambridge, Mass. 02138.

■

Datasystems Software Corp. has enhanced its microcomputer data entry software **Entrymanager Series** that validates input at character, field and form levels in distributed processing environments.

Additional features in Release 2.1 include key and sight verification, operator statistics, negative-field overpunch, floating-fill character and a revised reference manual and tutorial.

The package runs on IBM PC-DOS or Microsoft Corp. MS-DOS and Unix-based systems. Single-user licenses cost $695 for a development package and $450 for a runtime version.

Datasystems Software Corp., 7301 Topanga Canyon Blvd., Canoga Park, Calif. 91303.

Communications

Eesof, Inc. has announced the **Touchstone/VAX Connection** that links Digital Equipment Corp. VAX mainframes to personal computer workstations.

The program allows users to access the VAX from an IBM Personal Computer XT, AT or compatibles and to perform circuit design, analysis and optimization through the use of Touchstone, Eesof's RF/microwave design program.

The Touchstone/VAX Connection costs $13,000 for the VAX software and $9,900 for each Touchstone personal computer program.

Eesof, Suite 205, 31194 La Baya Drive, Westlake Village, Calif. 91362.

■

Meridian Technology has unveiled its **Carbon Copy** remote control software program for IBM Personal Computers, Personal Computer XTs, ATs and compatibles said to allow a local personal computer to control and monitor a remote personal computer over an asynchronous communications link.

The program runs as a background task on each communicating personal

Continued on page 121

Keep your file transfers on the tracks.

Features
○ Remote start-up possible, automatic restart.
○ Operations log per file containing number of NAKS, ENQS, blocks sent, records sent and the status of the completed transfer.
○ Multi-file, maximum block size of 512 bytes, RJE support.
○ Automatic translation between ASCII and EBCDIC.
○ Transparent mode (with the option translate into ASCII at arrival). It is possible to transfer binary files, dBase III, etc.
○ ASCII/EBCDIC/ASCII translation table modification possible.
○ The PC can be connected as slave or master.
○ PC3780 can be installed on the hard disk, and run manually or automatically without any operator intervention.
○ Parameters can be given manually or contained in a command file.
○ "CALL USING" interface available for local program execution and file dispatching on the fly.
○ Automatic connection is possible by using modems with an automatic answer.
○ Can be configured for auto-pilot by the central computer.

Minimum configuration necessary
An IBM PC/XT/AT/Portable or compatible with at least: - 128 Kbyte memory; - one IBM BSC-ASM card; - one 320 Kbyte diskette unit or a fixed disk.

TDT

EDITIS

TDT Inc., Rivergate Plaza, 444 Brickell Ave. Miami FLA 33131 Tel. (305) 372.93.32.

IBM PC/XT/AT/Portable, Topview and Personal Assistant are trademarks of International Business Machines Inc. PFS is a trademark of Software Arts. PC3780 is a trademark of TDT Inc.

Connections 2780/3780 RJE IBM PC - Mainframe.

A very powerful simple to use file transfer program for the IBM PC, PC3780 allows you to send and receive files between the IBM PC/XT/AT/ Portable or compatible and any other computer supporting any one of the following protocols: 2740, 3740, 3741, 2780, 3780. Using standard IBM hardware, PC3780 gives you fast, easy and error free file transfers.
Compatible with Topview and IBM PC Local Network. WriteMate option to download into Personal Assistant (PFS) file formats: 49 $.

Possible connections
○ PC to PC.
○ PC to any other computer which has one of the above protocols.
○ Interface V24 RS232.
○ By modem: .synchronous; .leased line; .public line; .half duplex; .maximum speed 9600 bauds; .clocks supplied by modem.
○ Direct line: .maximum speed 9600 bauds; .RX/TX clock must be supplied by the central site.

Characteristics
User may define: - record size; - number of records per block; - record separator as ITB or IRS; - trailing character suppression such as CR/LF at the end of each record; - end mark of each record; - suppression of unwanted characters in receive; - space compression.

60 DAY MONEY BACK GUARANTEE

EASY TO USE

Yes, send me immediately:
Quantity
PC3780 **149 $** ____
WriteMate option **49 $** ____

Subtotal ____
State Tax ____
Amount enclosed ____
Payment VISA MC BankDraft Check
Credit card Exp. Date ____ / ____
Card Nb ☐☐☐☐☐☐☐☐☐☐
☐☐☐☐☐☐☐☐☐☐
Name ____
Shipping Address ____
City ____
State ____ Zip ____
Telephone ____
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Compatibility
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>
> PC Week: *"...the machines IBM should have built." "...significant user advantages over IBM's machine... a standard dual-mode monitor, reliable tape backup,... better construction than IBM's, an impressively fast drive and other little extras—at a price below similarly configured IBM's."*
>
> Popular Computing: *"...genuine enhancements, such as higher CPU speed, greater RAM capacity, portability,... greater hard-disk capacity, and an optional tape backup unit."*

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A key reason for this increase in storage capacity is the chromium dioxide magnetic crystal.

Thanks to Du Pont chromium dioxide, the 18-track tape has a recording density of about 38,000 bytes per inch—six times higher than the current industry standard. This higher density makes it possible to pack more than a reel of data into the compact 4″ × 5″ cartridge you see above.

The higher density also contributes to

*ANSI proposal X3B5-182.
**ANSI X3.40-1983.

stores 20% more data in 75% less space.

an improved data transfer rate of 3 MBytes per second. So now you can process information more than twice as fast as before.

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For more information, write Du Pont Company, Room X50261, Wilmington, DE 19898, or call 302-992-2246.

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Continued from page 116

computer. It includes a file transfer feature with data compression techniques and is compatible with 10K bit/sec. asynchronous modems as well as Hayes Microcomputer Products, Inc.-compatible modems.

Carbon Copy costs $195.

Meridian Technology, Suite 120, 1101 Dove St., Newport Beach, Calif. 92660.

■

Dow Jones & Co. has released **Straight Talk Version 2**, an enhanced version of its information software program for the Apple Computer, Inc. Macintosh.

Straight Talk 2 is said to provide access to all 39 data bases of Dow Jones News/Retrieval Service as well as other information services. It can download programs and program updates. Other features include allowing users to save information on disk and to print while on-line.

Straight Talk Version 2 costs $95.

Dow Jones & Co., P.O. Box 300, Princeton, N.J. 08540.

■

The Software Link, Inc. has announced IBM Netbios versions of its **Multilink Advanced** multiuser, multitasking software and **Lanlink** software-driven network.

Netbios-compatible Multilink Advanced will reportedly provide direct memory-to-memory communications with no need to wait for device response. Lanlink with the Netbios standard will allow users to gain access to applications software written to Netbios specifications.

Multilink Advanced supporting Netbios will be available in March. Netbios Lanlink will be available in July. Each cost $495.

The Software Link, Suite 632, 8601 Dunwoody Place N.E., Atlanta, Ga. 30338.

■

Contel Information Systems, Inc. has released **RTfile/LAN**, a multiuser version of RTfile/DOS V9, its relational data base management system for IBM Personal Computers or compatible microcomputers operating in the 3Com Corp. Etherseries environment.

According to the vendor, single-CPU, site and corporate licenses cost $500, $5,000 and $10,000, respectively.

Contel, 4330 East-West Highway, Bethesda, Md. 20814.

■

Forte Communications has enhanced its **Fortegraph S3G** micro-to-mainframe graphics program to enable it to support the IBM Enhanced Graphics Adapter (EGA) monitor.

Fortegraph S3G users with IBM EGA monitors can print mainframe graphics on a personal computer, transfer and store graphics in an IBM PC-DOS file and recall graphics off-line from the mainframe.

Fortegraph S3G emulates the IBM 3279 S3G terminal and supports Forte's Fortenet file transfer program and Forte FTS software.

Fortegraph is priced at $1,995 with a Forte PJ communications board and at $995 without the board.

Forte Communications, 2205 Fortune Drive, San Jose, Calif. 95131.

Logicraft, Inc. has announced **Linkware**, a package that reportedly allows users to access Digital Equipment Corp. disk files and output peripherals from IBM Personal Computers.

Linkware includes IBM Personal Computer drivers, DEC communications programs, a VT-220 emulator for logging on to the DEC system and transforming the Personal Computer into a fully compatible VT-220 terminal and DOSFLX for interchanging data files.

According to the vendor, a modem is necessary for communicating with the DEC system.

Linkware is priced at $1,495 for the minicomputer version, and it costs $195 for the Personal Computer version.

Logicraft, 410 Amherst St., Nashua, N.H. 03063.

Data storage

Analog and Digital Peripherals, Inc. has announced the **Easi-Disk**, an RS-232 5¼-in. floppy data storage and transfer system for IBM Personal Computers and compatibles.

The Easi-Disk allows data transfer between an IBM Personal Computer and noncompatible IBM devices over the RS-232C interface. According to the vendor, it reads and writes IBM PC-DOS 5¼-in. disks.

Its features reportedly include RS-232C I/O, rugged portable package, host and/or manual controls, ASCII or full binary operation, selectable data transfer rates from 110 to 19.2K bit/sec. and automatic data verification.

The system costs $1,095.

Analog and Digital Peripherals, 815 Diana Drive, Troy, Ohio 45373.

Printers/plotters/peripherals

Perma Power Electronics, Inc. has introduced the **Color Commander**, a peripheral device for IBM Personal Computers and Personal Computer XTs said to expand the color potential of any IBM red-green-blue digital color monitor system.

The Color Commander reportedly forms a connection between the computer and the monitor.

The product allows the user to change any color called for by a software program with the push of a button. According to the vendor, the Color Commander can be used with any personal computer graphics software.

The Color Commander sells for $359.

Perma Power Electronics, 5601 W. Howard Ave., Chicago, Ill. 60648.

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Board-level devices

Hexace Technologies, Inc. has added the **Multiport Plus** card to its line of enhancement products for the IBM Personal Computers and compatibles.

The Multiport Plus card provides an RS-232C serial interface, a parallel printer port and a clock/calendar, the vendor said.

The product comes with Hexace software that includes RAMdisk, a disk emulation program, and Pspool, an intelligent print spooler that allows the user to output files to a printer without tying up the personal computer.

The Multiport Plus card is priced at $259, according to Hexace Technologies.

Hexace Technologies, 271 N. Mathilda, Sunnyvale, Calif.

Eotron Corp. has introduced the **Eograph**, a graphics processor and data buffer that produces high-resolution graphics on dot matrix printers.

The Eograph is a controller board for the IBM Personal Computer, Personal Computer XT or AT. It combines vector-to-raster processing with large-capacity spooling capabilities to optimize the throughput of both printer and personal computer, Eotron said.

Plotter as well as printer emulation is provided, and the board can do extended multipage plots on fanfold paper.

Eograph costs $495 for the 128K-byte version and is priced at $595 for a 512K-byte version, according to the vendor.

Eotron, 121 Westpark Road, Dayton, Ohio 45459.

COMMUNICATIONS

Controllers

Digital Communications Associates, Inc. has expanded its Series 300 network product line to include the **System 330** and the **System 332** dual-trunk network processors and the **System 334** dual-trunk bisynchronous network processor.

All three products are said to offer modular hardware, network switching, network management and flexible software. The System 330 has either 10 or 26 ports and can operate up to 19.2K bit/sec. The System 332 has either 12 or 24 ports and can operate at speeds up to 72K bit/sec.

The System 334 connects four, eight or 12 bisynchronous lines from one or more IBM 3270 terminal controllers to a packet-mode host or public data network at speeds up to 72K bit/sec.

Prices range from $6,495 to $19,995.

Digital Communications Associates, 1000 Alderman Drive, Alpharetta, Ga. 30201.

■

Protocom Devices has introduced the **P250** customer premises equipment X.25 pad.

The P250 is said to permit IBM 3270 Binary Synchronous Communications and Systems Network Architecture/Synchronous Data Link Control devices to connect to X.25 packet-switched networks. The unit offers support for independent addressing of up to 32 logical units.

The P250 is priced at $1,500.

Protocom Devices, 190 Willow Ave., New York, N.Y. 10454.

Protocol converters

Quasitronics, Inc. has announced the **Pipe Six** intelligent data switch.

Pipe Six has six RS-232 I/O ports that provide communications between dissimilar systems and peripherals operating at different data transfer rates, word structures and flow control techniques.

It features 54K bytes of dynamically allocated memory for speed conversion, printer buffering, message storage and private mail. According to the vendor, it can handle concurrent communications between all of its interactive ports.

Pipe Six costs $1,250.

Quasitronics, 211 Vandale Drive, Houston, Pa. 15342.

Multiplexers/modems

Case Communications, Inc. has added Data Recovery to its full-duplex two-wire 2,400-bit/sec. **Case 1224 modem** for use on the direct-distance-dial network or two-wire point-to-point leased circuits with fallback to 1,200 bit/sec.

Data Recovery allows error detection and block retransmission to occur in the modem itself. It can be turned on and off with option switches or by instructions from a terminal. The Case 1224 can be used to transmit synchronous or asynchronous traffic.

The Case 1224 with Data Recovery stand-alone unit is priced at $649.

Case Communications, 2120 Industrial Pkwy., Silver Spring, Md. 20904.

Local-area networks

Ungermann-Bass, Inc. has introduced the **Net/One High Speed Remote Bridge** designed to link remote sites of the vendor's Net/One local-area networks.

Reportedly, the bridge can be configured to support data-link speeds from 4.8K bit/sec. to 2.048M bit/sec. It supports all Net/One network management functions so that a single Ungermann-Bass Network Management Console can manage an entire Net/One internet as one local network.

The High Speed Remote Bridge is available in models to connect Net/One Ethernet baseband, optical-fiber or broadband media. The units are priced at $9,950.

Ungermann-Bass, 2560 Mission College Blvd., Santa Clara, Calif. 95052.

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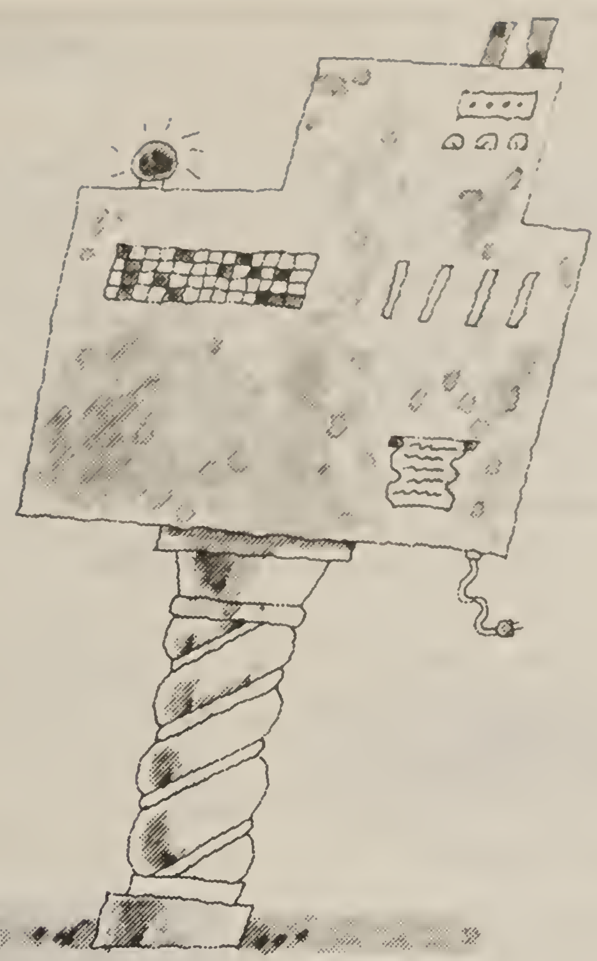
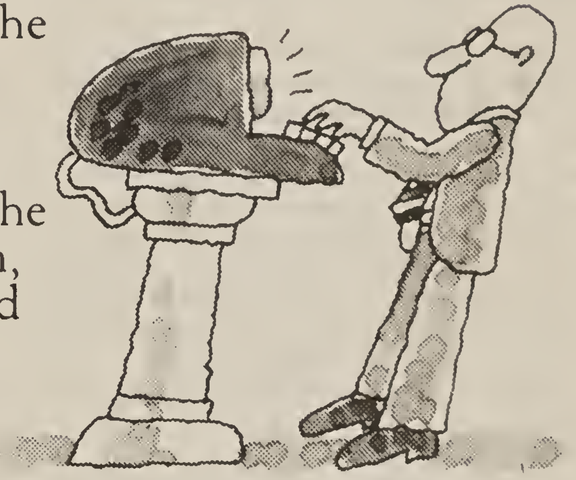
WANTED: OLD THINKER TOYS.

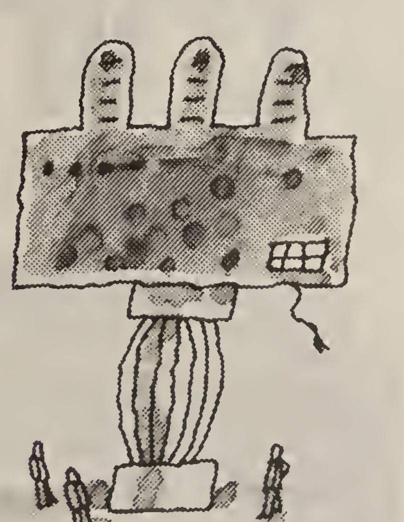


CW Communications, ComputerLand and The Computer Museum invite you to send in your early personal computers, software, and memorabilia — you could win a free trip to The Computer Museum in Boston

Your old, dusty "thinker toy" may now be ready to become a treasured museum piece. The Computer Museum in downtown Boston — an international museum dedicated entirely to computing — is searching for the very best and most unique relics of the personal computer revolution.

ComputerLand, CW Communications, and The Computer Museum are working together to bring these early relics out of your attic and into the collection of The Computer Museum. The museum is especially looking for kit machines, prototypes, programs, output, newsletters and memorabilia of early computing from around the world. A selection of the finest items will be used to create an exhibit on the evolution of personal computers and a catalog highlighting the Museum's collections. If your submission is accepted for addition to the Museum collection, you will be invited to the grand opening of the exhibit and will receive a bound edition of the catalog. If your item is selected as one of the five best "finds", you will also receive an all-expense-paid trip to Boston for the grand opening party.





So, get up to the attic, down to the cellar and into your closets, and tell us what you find! Call or write the Museum for an official entry form, or send a photo and description of your items by March 1, 1986 to: The Computer Museum, Personal Computer Competition, 300 Congress St., Museum Wharf, Boston, Massachusetts USA 02110, (617) 426-2800, Telex: 62792318.

ComputerLand®

The Computer Museum

CW COMMUNICATIONS/INC.

Entries will be judged on significance, rarity, date, completeness and condition. Items particularly sought include pre-1980 machines, early serial numbers (get those number 1's out), machines made for purchase outside of North America (even modern machines are sought in this category); first releases of software such as first releases of operating systems, languages and mass-marketed and original applications; and pre-1980 photographs, newsletters, manuals and other records. The Computer Museum is a private non-profit educational institution. All donations are tax deductible according to the provisions of the Internal Revenue Service. Thinker Toys is a registered trademark of George Morrow & Morrow Designs, Inc.

Kaye Instruments, Inc. has enhanced its **Digistrip 4** data loggers by adding the Auto Trend option.

Auto Trend is said to provide 10 additional capabilities allowing users to print trend report pretrigger history prior to current real-time data, to define up to nine trending/graphical reports plus three alphanumeric data reports, to choose from three trending formats and to present page-oriented report-ready printouts.

The price for the Digistrip 4 data loggers with Auto Trend starts at $5,500.

Kaye Instruments, 15 De Angelo Drive, Bedford, Mass. 01730.

SYSTEMS & PERIPHERALS

Turnkey systems

Pentamation Enterprises, Inc.'s Systems Eleven Division has introduced the **Systems Eleven/RSTS System** and the **Systems Eleven/Microvax System**, two computer systems designed for small and mid-size school districts.

Both combine Systems Eleven's Business Office software and Student Services software with Digital Equipment Corp.'s PDP-11 or Microvax hardware. The Student Services package offers student registration and scheduling, grade reporting and class attendance accounting. The Business Office package has personnel and payroll as well as budgeting and general ledger capabilities.

Both systems start at about $60,000.

Systems Eleven, One Pomperaug Office Park, Southbury, Conn. 06488.

Graphics systems

Megatek Corp. has introduced a Digital Equipment Corp. Microvax II option, called **9250**, for its 9200 series of interactive, surface-rendering graphics display devices.

The 9250 is said to be fully integrated with the Microvax II software and hardware.

Features of the workstation reportedly include translucent and opaque surfaces; X-, Y- and Z-axis clipping of objects; shading; depth cuing; perspective; and surface textures.

The price of the Megatek 9250 starts at $55,000.

Megatek, 9645 Scranton Road, San Diego, Calif. 92121.

Data storage

Aviv Corp. has announced the **Model MV 805 Tape Multiplexer Kit**, which is said to allow sharing of the tape system already attached to a Digital Equipment Corp. VAX with a DEC Microvax.

The MV 805 is an electronic switch that can be added to any Group Coded Recording tape system.

The product emulates a DEC TSVO5 driver and is compatible with MicroVMS. Aviv's TFC 925 Tape Controller resides in the Microvax.

The MV 805 allows up to six computers to share any tape drive.

Prices for a Storage Technology Corp.-type interface start at $3,250; a Pertec Computer Corp.-type interface starts at $2,950. Support for additional CPUs costs approximately $1,500.

Aviv, 26 Cummings Park, Woburn, Mass. 01801.

Terminals

Telex Computer Products, Inc. has announced its **180-1 display terminal** said to be plug compatible with the IBM 3180 Model 1.

The terminal comes with either a green or amber display, and it features user-selectable screen sizes configured from the unit's keyboard or host application program.

It attaches to either an IBM 3274, 3276, 4321, 4361 or comparable Telex controller.

The product reportedly offers automatic screen cutoff, local screen print capability, response time monitor, vertical scrolling and configurable serial input port.

The Telex 180-1 is priced at $2,195.

Telex Computer Products, 6422 E. 41st St., Tulsa, Okla. 74135.

Communication Machinery Corp. has announced the **DRN-2100** local-area network server said to permit direct access to the Department of Defense's Defense Data Network and the **DRN-1100** Ethernet terminal server.

Both terminal servers can provide direct terminal connection for eight or 16 asynchronous terminals of any kind, according to Communication Machinery. They both feature a Motorola, Inc. 10-MHz 68000 microprocessor, 512K bytes of dynamic random-access memory with parity and 128K bytes of erasable programmable read-only memory.

The DRN-2100 sells for $10,990, and the DRN-1100 is priced at $7,490.

Communication Machinery, 1421 State St., Santa Barbara, Calif. 93101.

Burr-Brown Corp. has introduced the **TM8400 Microterminal** multifunction terminal.

The TM8400 contains a backlit LCD and a user-definable elastomeric keyboard. It can be used as a CRT or as a block-mode terminal in multidropped operation, and it can also monitor communications.

Parameters including operational modes, bit/sec. rate and protocol are established interactively using the function keys at initial setup, the vendor said.

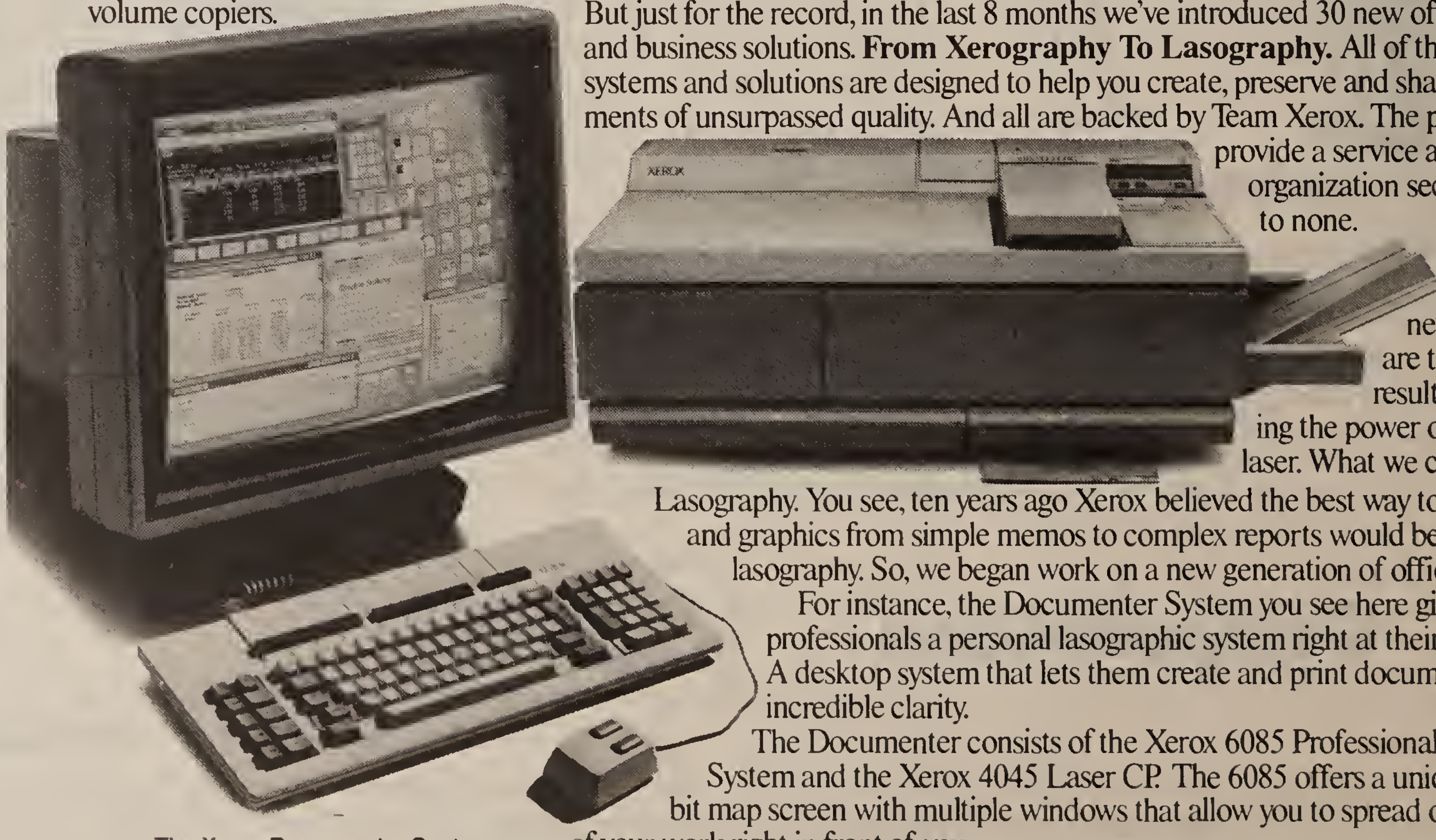
The terminal can be expanded by adding any of three types of plug-in modules: communications, peripheral and auxiliary.

The price of the TM8400 is $745. The price of the options for the terminal start at $125.

Burr-Brown, P.O. Box 11400, Tucson, Ariz. 85734.

When you think of Xerox what do you think of?

It's almost instinctive to think of copiers whenever the name Xerox is mentioned. After all, 25 years ago we invented the category. And since that time we've become the gold standard for dependable and diverse desktop, mid and high volume copiers.



The Xerox Documenter System.

But just for the record, in the last 8 months we've introduced 30 new office system and business solutions. **From Xerography To Lasography.** All of these new systems and solutions are designed to help you create, preserve and share documents of unsurpassed quality. And all are backed by Team Xerox. The people wh provide a service and suppor organization second to none.

Most of these new systems are the direct results of harne ing the power of the laser. What we call Lasography. You see, ten years ago Xerox believed the best way to print text and graphics from simple memos to complex reports would be through lasography. So, we began work on a new generation of office systems

For instance, the Documenter System you see here gives office professionals a personal lasographic system right at their fingertip A desktop system that lets them create and print documents of incredible clarity.

The Documenter consists of the Xerox 6085 Professional Compute System and the Xerox 4045 Laser CP. The 6085 offers a unique 19 inc bit map screen with multiple windows that allow you to spread out all of your work right in front of you.

In fact, its windows allow you to work on many things at once. Using either our ViewPoint® or MS-DOS® software.

And when you're ready to print documents, you can use the Xerox 4045 Laser CP shown here or one of the latest Xero Diablo printers.

XEROX® and the identifying names and numbers are registered trademarks of XEROX CORPORATION. MS-DOS® is a registered trademark of Microsoft Corporation IBM is a registered trademark of the International Business Machines Corporation. ViewPoint® is a registered trademark of XEROX CORPORATION.

NEW PRODUCTS/SYSTEMS & PERIPHERALS

Tatung Company of America has announced its **CM-1370/AT&T** version monitor designed for use with AT&T's PC 6300 and PC 6300 Plus.

The 13-in. display offers 720- by 400-line resolution and 16 colors.

It features green text mode, nonglare screen and dark face tube to provide contrast capabilities.

The monitor also contains a device on the back of the unit for picture adjustment to center the material on the screen.

The CM-1370/AT&T version monitor is priced at $799. It requires a special cable adapter that costs $39.

Tatung, 2850 El Presido St., Long Beach, Calif. 90810.

■

G. R. Electronics has announced the **Oyster** laptop terminal.

The Oyster incorporates a standard-size keyboard and a 16-line LCD.

It features data transfer rates up to 19.2K bit/sec., internal rechargeable battery pack, scrolling and Digital Equipment Corp. VT100 compatibility.

The Oyster is compatible with any RS-232C variant and will work with or without handshaking, according to the vendor.

Prices for the Oyster terminal begin at $895.

G. R. Electronics, Suite 200, 444 N. Altadena Drive, Pasadena, Calif. 91107.

■

U.S. Pixel Corp. has announced a series of **high-resolution monochrome CRT monitors** for use in computer graphics, phototypesetting and medical and industrial imaging applications.

The 2.2-million-pixel displays utilize a 180-MHz emitter-coupled logic video amplifier that allows bit-plane controllers to run pixel clocks up to 200 MHz.

The monitors with the high-speed video amplifiers come in four sizes: 5-in., 17-in., 19-in. and 23-in., according to the vendor.

Pricing starts at $573.

U.S. Pixel, 59 Fountain St., Framingham, Mass. 01701.

Printers/plotters

Syntest Corp. has introduced the **SP-700** two-color impact printer.

The printer is said to offer a switch-selectable 20-mA loop or RS-232C input interface at rates from 150 to 9.6K bit/sec.

It offers the standard 103-char. ASCII subset and permits data or text-mode printing at speeds up to 1.8 line/sec.

The printer has an internal 40-char. buffer and can operate with either 115V ac or 12V dc power input, according to the vendor.

The SP-700 is priced at $385, Syntest said.

Syntest, 40 Locke Drive, Marlboro, Mass. 01752.

■

Advanced Computer Communications has announced its **Laser Printer Interface LPI 690**.

The LPI 690 is said to provide users of Digital Equipment Corp. VAX computers with on-line access to a Xerox Corp. 8700 or 9700 laser printer.

The interface consists of a microprocessor-based hardware/software package.

The interface queues jobs to the printer, inserts banner pages and controls page format and type selection.

The LPI 690 is priced at $28,000 with additional hardware units priced at $15,000, according to the vendor.

Advanced Computer Communications, 720 Santa Barbara St., Santa Barbara, Calif. 93101.

■

Dataproducts Corp. has announced **printer conversions** for its **B series** of high-speed band printers.

The conversion, from the B-300 to the B-600, is said to double the print speed of the system, from 300 line/min to 600 line/min.

Included in the conversion process are full factory evaluation, use of original tested factory parts and certification, according to Dataproducts spokesmen.

The price of the reconfiguration is $2,497.

Dataproducts, 21300 Roscoe Blvd., Canoga Park, Calif. 91304.

■

Megacom, Inc. has introduced its **Megaprint** laser printing system.

The Megaprint product line is available in 30, 60, 90 and 120 page/min versions. According to the vendor, it is capable of printing up to one million pages per month per operating shift.

The Megaprint features a Printer Control Module, developed by Megacom, which is said to manage up to four input devices or data networks and up to four output printing devices in an automatic or operator-controlled environment.

The Megaprint product line ranges in price from $125,000 to $325,000, the vendor said.

Megacom, Suite 115, 3925 Coconut Palm Drive, Tampa, Fla. 33619.

■

Gold Key Electronics, Inc. has added the **Switchmate 2 + 2** to its line of intelligent printer switches.

The Switchmate 2 + 2, designed for use with Digital Equipment Corp. systems and serial printers, allows two systems to access either of two serial printers, according to the vendor.

Continued on page 126

XEROX

The Xerox 4050 Laser Printing System featured here is the newest lasographic printer from Xerox. It offers the power and capabilities of the Xerox 9700 and 8700 in a medium speed laser printer.

We're also introducing the Xerox XPS 701. A low cost, full function, turnkey publishing system. The entry level XPS 701 enables you to create and manage text and graphic input. It's especially designed for large illustrated documents that require frequent revision, fast production turnaround and relatively small print runs.

And for those who want more than a line printer but less than a laser printer, there's the Xerox 4060 Computer Printing System. Using Ion Deposition Technology, the advanced 4060 is ideal for the IBM data center.

Yet another exciting capabilities story revolves around networks and software.

The Xerox 4050 Laser Printing System.

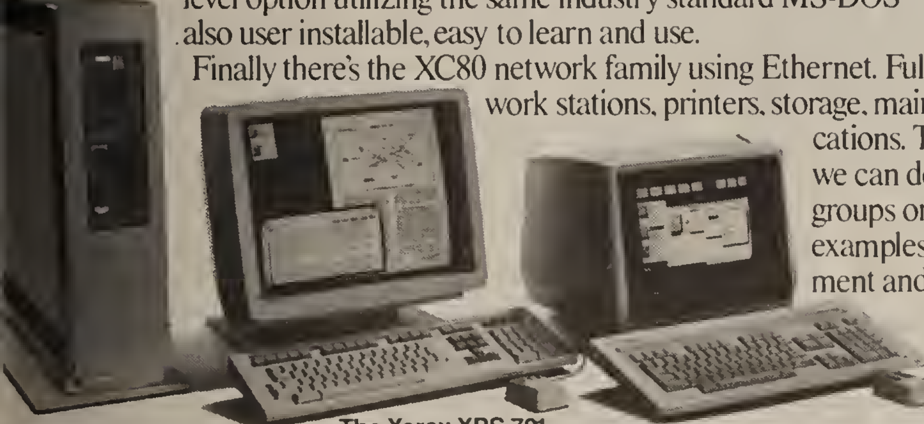
The Most Complete Family Of Networks.

Xerox now offers the most comprehensive networking capabilities in the industry.

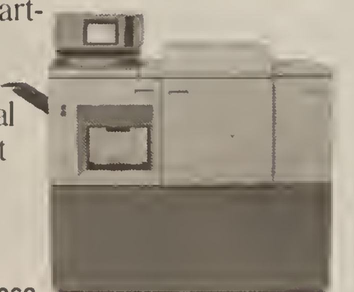
The new XC22 twisted pair network, is low cost and simple to install and takes advantage of existing telephone wires. The XC22 allows work groups to share information and resources such as laser printers and rigid disks.

The XC24 System uses a coaxial cable that can easily run along the base of office walls or in ceilings. And it's an entry-level option utilizing the same industry standard MS-DOS® operating system as does the XC22. The XC24 is also user installable, easy to learn and use.

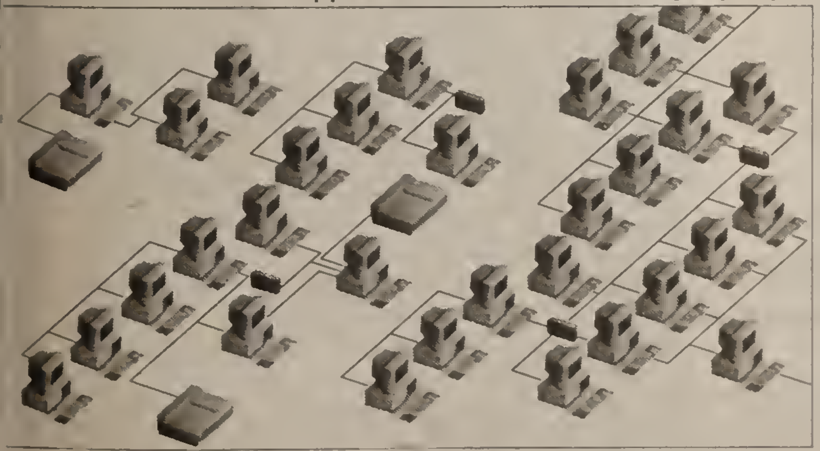
Finally there's the XC80 network family using Ethernet. Fully configured networks, with virtually unlimited work stations, printers, storage, main frame communications and internetworking applications. The key to all of these networking capabilities is that we can design business solutions that enable small work groups or full departments to easily share information. Two examples are the new Xerox Integrated Financial Management and Purchasing Management Solutions. Both contain powerful departmental processing options such as sophisticated relational data-base management, host program access, electronic mail and high capacity file, disk and print services which enable each application to fulfill complete purchasing or financial needs. Xerox is also introducing the 4020 Color Ink Jet Printer, which is also network compatible. The 4020 can produce up to 4000 shades of seven primary colors. And finally Xerox is introducing the Telecopier 7010. A portable digital facsimile transceiver that can transmit a hand written or typed page in just 25 seconds. Before we leave we'd like to remind you of Team Xerox. A unified support structure that includes people, products and services. All here to help you every step of the way.



The Xerox XPS 701.



The Xerox 4060 Computer Printing System.



Xerox Networks.

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Send this coupon to: Xerox Corporation, P.O. Box 24, Rochester, NY 14692.

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(1-800-832-6979, ext. 213)

Continued from page 125

Each system maintains its own printer selection independently of the other system. This allows both systems to queue to the same printer or simultaneously queue to both printers.

The Switchmate 2+2 is priced at $749.

Gold Key Electronics, P.O. Box 186, Goffstown, N.H. 03045.

■

Western Graphtec, Inc. has announced the **GP 9001** B- through E-size plotter.

The GP 9001 allows paper size selection via a knob adjustment.

It is compatible with either Graphtek, Inc. or Hewlett-Packard Co. protocols.

The GP 9001 offers 10 in./sec. pen speed and three standard interfaces, according to the vendor.

The Centronics Data Computer Corp. parallel interface is built in, and the user can add either an RS-232C or IEEE/GPIB.

Pens are available in a choice of oil- or water-base fiber tip, ceramic or ink.

The carousel holds four pens.

The plotter is priced at $6,050.

With either of the other interface options added, the price is $6,275.

Western Graphtec, 12 Chrysler St., Irvine, Calif. 92718.

Power supplies

NES, Inc. has added a **4½-digit Ohmmeter** to its Slimline series. of digital panel meters.

The Ohmmeter allows users to determine if just one turn of a winding is shorted as well as measure the contact resistance of a switch, relay or connector.

It is capable of the four-wire or two-wire measurement technique, according to NES.

The meter itself measures 3½- by 4½- by ¾-in. and mounts on the front of the panel.

It can be adapted for programmable controller or computer interface, the vendor said.

Prices for the Slimline 4½-digit Ohmmeter start at $253.

NES, 3003 Wakefield Drive, Carpentersville, Ill. 60110.

■

Western Telematic, Inc. has introduced the **Call Power** power switch, which reportedly turns a computer system on and off via modem commands.

The switch allows computer systems to be turned off at night or on weekends and still be accessed remotely at any time by up to four modems. Call Power has built-in surge protection and a circuit breaker and switches up to 10A of ac power. It offers a bypass switch for local control.

The switch is priced at $295.

Western Telematic, 2435 S. Anne St., Santa Ana, Calif. 92704.

■

Power Systems & Controls has introduced the 1,000-kVA **Rotary Uninterruptible Power System**.

The system consists of a hybrid uninterruptible power system with rectifier/charger, inverter and rotary filter connected in series. The system is also available in 500-, 625- and 750-kVA modules. All modules can be paralleled for higher capacity or for redundant operation.

The system provides positive isolation said to completely block high-frequency noise and lighting surges. It does not incorporate static switching.

Prices range from $105,000 to $200,000, depending on voltage.

Power Systems & Controls, 3206 Lanvale Ave., Richmond, Va. 23230.

Auxiliary equipment

Intermec Corp. has announced the **1260 Wand series** of digital bar code wands.

The wands attach to Intermec's 9510 bar code reader and employ synthetic sapphire optics. Three wands are available: the Model 1260 for high- and very high-density symbols, the Model 1261 for medium and low density and the Model 1266 Infrared Wand for scanning high- and very high-density symbols printed with high-carbon ink. The wands feature a modular telephone-style cable connector.

In single quantities, the 1260 wands are priced at $159.

Intermec, P.O. Box 360602, 4405 Russell Road, Lynwood, Wash. 98046.

■

HEI, Inc. has introduced the **Feather** cordless lightpen.

Feather communicates with a terminal or host computer via an infrared light source and receiver. It can be used in interactive graphics, cursor control and menu and icon selection.

The Feather cordless lightpen is priced at $195 and will be available in March.

HEI, Victoria, Minn. 55386.

■

Concert Corp. has unveiled **QE-100**, a portable, real-time statistical quality control analyzer, data collector and measurement device.

The QE-100 is said to accept single or multiple inputs from electronic measurement technologies supporting comparative or direct reading gauging requirements.

The QE-100 has three units: analytical, interface and the rechargeable and removable battery pack, the vendor said.

The analytical unit with four analog/digital input units costs $2,990.

Concert, 1 Prestige Place, Miamisburg, Ohio 45342.

January 28, 1986

Applied Data Research, Inc.

has been acquired by

American Information Technologies Corporation

The undersigned assisted in the negotiations and acted
as financial advisor tc Applied Data Research, Inc.

Salomon Brothers Inc

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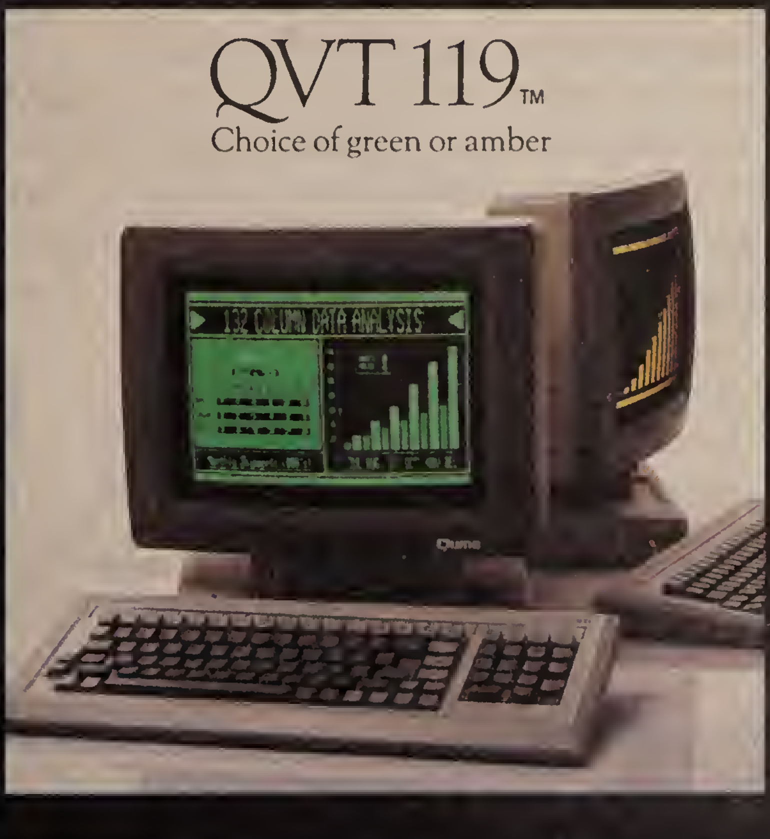

Now you can have all the capabilities of a dozen powerful ASCII terminals in one visionary design—the QVT 119™ editing terminal. The speed, flexibility and incomparable features of the QVT 119 put a whole new universe of system enhancements within your grasp. How far could your system get with the QVT 119? For $595, the sky's the limit. For a closer look, call 800-223-2479. Qume Corporation, 2350 Qume Drive, San Jose, CA 95131.

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Galaxy visual courtesy of the National Optical Astronomy Observatories.

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PRICE REDUCTIONS

Sanyo Business Systems Corp. has announced price reductions on its **MBC555-2**, **MBC675**, **MBC775** and **MBC885** microcomputers.

The desktop MBC555-2 is now priced at $849. The portable MBC675 costs $1,599. The portable color MBC775 is now priced at $2,299. The MBC885 IBM Personal Computer XT-compatible with two 360K-byte floppy disk drives, seven expansion slots and 4.77-MHz or 8-MHz switchable clock speed now costs $1,499.

Sanyo Business Systems, P.O. Box 387, 51 Joseph St., Moonachie, N.J. 07074.

■

Corvus Systems, Inc. has reduced the price of its **Omninet** local-area network interface cards for the IBM Personal Computer and Apple Computer, Inc. Apple IIe and Macintosh.

Omninet is said to be the industry standard for twisted-pair, local-area networks. The new price per card is $199.

Corvus Systems, 2100 Corvus Drive, San Jose, Calif. 94124.

■

Tecmar, Inc. has reduced the price of its **Maestro AT** 2.5M-byte multifunction board.

The Maestro board was designed for the IBM Personal Computer AT. It contains a parallel printer port, a serial port and up to 2.5M bytes of memory.

The new price for the fully configured version is $1,395. With zero kilobytes, it costs $529; with 128K bytes, it costs $589; with 384K bytes, it costs $695; with 640K bytes, it costs $795; and with 1,664K bytes, it costs $1,095.

Tecmar, 6225 Cochran Road, Solon, Ohio 44139.

■

Kamerman Labs has announced that it will offer its **Kamerman Labs XT Kit 1** free to purchasers of its Masterflight hard-disk and tape backup systems.

Anyone purchasing any Masterflight system will receive a free Kamerman Labs XT Kit 1, which includes an IBM-compatible computer equipped with 128K bytes of memory and a keyboard. A Kamerman Labs XT Kit 2 with 640K bytes of memory as well as an XT Kit 3 that has an added monochrome monitor and monitor card are available for an additional $399 and $599, respectively.

The Masterflight hard-disk product series costs up to $2,495.

Kamerman Labs, 7861 S.W. Cirrus, Beaverton, Ore. 97005.

■

Living Videotext, Inc. has announced price reductions for its **Thinktank 128** and **Thinktank 512** software for the Apple Computer, Inc. Macintosh.

The new prices are $99.95 for Thinktank 128 and $195 for Thinktank 512.

Upgrading from Thinktank 128 to Thinktank 512 is still priced at $100.

When registering, the user has the option of receiving a free backup disk or a non-copy-protected version for $40, the vendor said.

Living Videotext, 2432 Charleston Road, Mountain View, Calif. 94043.

■

Cordata, Inc. has reduced the price of its **LP-300 Desktop Printshop** laser printer.

The LP-300 Desktop Printshop interfaces with Cordata personal computers and its IBM Personal Computer AT-like machines and the IBM Personal Computer family and compatibles.

The product produces up to eight page/min of combined text and graphics at a resolution of 300 by 300 dot/in.

The new price is $2,995, the vendor said.

Cordata, 275 E. Hillcrest Drive, Thousand Oaks, Calif. 91360.

■

General Electric Co. has cut the price of its **GEscan** sequential text-search system.

The GEscan system is a hardware-based data retrieval product. It supports full text search and retrieval from unstructured textual files and provides real-time automated message processing.

The price reduction is from $95,000 to $50,000.

GE, Silicon Systems Technology Department, Research Triangle Park, N.C. 27709.

THE ONLY SYSTEM IN THE OFFICE WE CAN'T ACCESS.

You don't have to put *every* system in your office, factory or lab on a network.

Just most of them.

And the more kinds of equipment you have, the more you need Bridge.

We network more systems from more vendors than anybody.

Our CS/1-SNA Communications Server lets async terminals talk to IBM® hosts by making them look like 3278s.

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Thanks to EtherTerm,™ we can turn IBM® PCs into async terminals and link you up to any device on your network.

And our Gateway Servers hook up all your networks. X.25, broadband and Ethernet. Across town or across the country.

We even have Management Servers to help you configure, control and monitor your entire network from any terminal.

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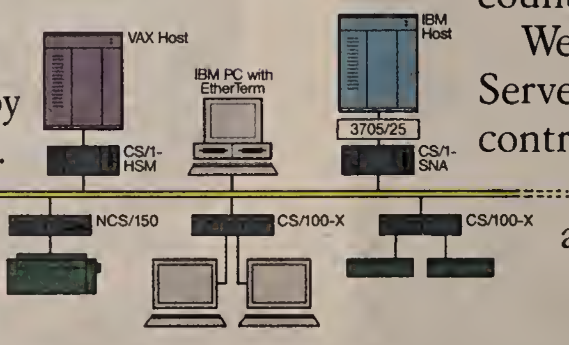

CALENDAR

WEEK OF FEB. 16

FEBRUARY 16-19, AUSTIN, TEXAS — **The DCEA Conference: Desktop Computers in Engineering and Architecture.** Contact: Donna Passons, University of Texas CLE Program, 727 E. 26th St., Austin, Texas 78705.

FEBRUARY 17-18, OTTAWA — **Principles of Prototyping**. Contact: Thomas J. Bisacquino, Director of Education, Association for Systems Management, 24587 Bagley Road, Cleveland, Ohio 44138. Also being Feb. 20-21 in Cincinnati.

FEBRUARY 18-19, NEW YORK — **Intro to Dbase.** Contact: Center for Advanced Data Processing, Suite 402, 450 7th Ave., New York, N.Y. 10123.

FEBRUARY 18-19, SAN FRANCISCO — **IBM's Master Plan, 1986-1990**. Contact: the Yankee Group, 14th Floor, 89 Broad St., Boston, Mass. 02110.

FEBRUARY 18-19, SAN JOSE, CALIF. — **Institute of Electrical and Electronics Engineers, Inc. 1986 Annual Meeting.** Contact: IEEE, Annual Meeting Department, 10th Floor, 345 E. 47th St., New York, N.Y. 10017.

FEBRUARY 20, LONDON — **Europe Invitational Computer Conference Series.** Contact: Beatrice Labbe-Anderson, International Conference Director, Invitational Computer Conference, No. C-2, 3151 Airway Ave., Costa Mesa, Calif. 92626. Also being held Feb. 25 in Frankfurt, Feb. 27 in Zurich, March 4 in Paris and March 10 in Tel Aviv.

FEBRUARY 20-21, MADISON, WIS. — **DBMS Software: Functions — Package Comparison**. Contact: Thomas J. Bisacquino, Director of Education, Association for Systems Management, 24587 Bagley Road, Cleveland, Ohio 44138. Also being held Feb. 24-25 in Philadelphia and Feb. 27-28 in Chicago.

WEEK OF FEB. 23

FEBRUARY 23-26, SAN FRANCISCO — **Seventh Structured Development Forum.** Contact: Garant and Associates, Seventh Structured Development Forum, 45 Via Navarro, Greenbrae, Calif. 94904.

FEBRUARY 24-26, MARINA DEL REY, CALIF. — **Trax User Conference.** Contact: Trax Softworks, Inc., 10801 National Blvd., Los Angeles, Calif. 90064.

FEBRUARY 24-28, LOS ANGELES — **Adajug/Sigada Conference.** Contact: Benjamin Brosgol, Vice-Chairman of Sigada, Alsys, Inc., 1432 Main St., Waltham, Mass. 02154.

FEBRUARY 24-29, PARIS — **MICAD '86.** Contact: Caby C. Smith, World Computer Graphics Association, Suite 399, 2033 M St. N.W., Washington, D.C. 20036.

FEBRUARY 25-26, SOMERSET, N.J. — **Writing Management Reports**. Contact: Mary Ann Cluggish, Information Mapping, Inc., 275 Wyman St., Waltham, Mass. 02154.

FEBRUARY 26, DEDHAM, MASS. — **Marketing Strategies/Marketing Communications.** Contact: Frank R. Trocki, Graphic Arts Program, Northeastern University, Center for Continuing Education, 370 Common St., Dedham, Mass. 02026.

FEBRUARY 26-27, NEW YORK — **Intro to Symphony: The Spreadsheet — Symphony for Spreadsheet Users.** Contact: Center for Advanced Data Processing, Suite 402, 450 7th Ave., New York, N.Y. 10123.

FEBRUARY 26-28, NEW ORLEANS — **Innovative Systems, Inc. Annual Users Group Conference.** Contact: Innovative Systems, Inc., 341 Fourth Ave., Pittsburgh, Pa. 15222.

FEBRUARY 27, FORT LAUDERDALE, FLA. — **U.S. Invitational Computer Conference.** Contact: Suzanne Hubner, U.S. Conference Director, Invitational Computer Conference, No. C-2, 3151 Airway Ave., Costa Mesa, Calif. 92626. Also being held March 18 in San Jose, Calif.

WEEK OF MARCH 2

MARCH 3-4, SYRACUSE, N.Y. — **End-User Computing: Managing Information Centers.** Contact: Thomas J. Bisacquino, Director of Education, Association for Systems Management, 24587

See **CALENDAR** page 131

word for it. Ask us to demonstrate it for you.

And while you're at it, let us bring you up to speed on our performance.

Our Communications Servers transfer over 200 packets a second. Our Gateway Servers do over 350 packets a second.

Your wish is our command.

Our user interface works just the way you'd expect it to work.

It's easy, logical, complete.

It's simple to change parameters, display statistics, execute command macros, broadcast messages anywhere on your network. Anytime.

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Bridge COMMUNICATIONS INC.

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When you store all your files on floppy disks, problems pile up.

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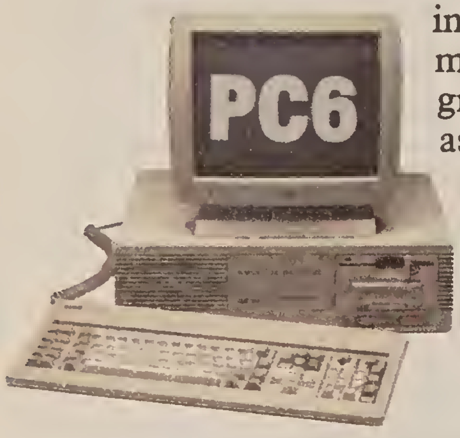

NEWS

CALENDAR from page 129

Bagley Road, Cleveland, Ohio 44138.

MARCH 3-7, DENVER — **Sixth Annual Alpha Micro Users Society Convention.** Contact: Sharon Greene, Alpha Micro Users Society, 735 Walnut St., Boulder, Colo. 80302.

MARCH 3-7, SCOTTSDALE, ARIZ. — **1986 Conference on EDP Performance Management.** Contact: Applied Computer Research, Inc., P.O. Box 9280, Phoenix, Ariz. 85068.

MARCH 4-6, PARIS — **Securicom '86 — Fourth Worldwide Congress on Communications Security and Protection.** Contact: Securicom-SEDEP, 8 Rue de la Michodiere, 75002 Paris, France.

MARCH 4-7, ORLANDO, FLA. — **Personal Financial Services.** Contact: Peggy Meyer, Bank Administration Institute, 60 Gould Center, Rolling Meadows, Ill. 60008.

MARCH 5-7, SCOTTSDALE, ARIZ. — **Society for Information Management Institutional Member Conference.** Contact: Society for Information Management, 111 E. Wacker Drive, Chicago, Ill. 60601.

WEEK OF MARCH 9

MARCH 9-12, SAN DIEGO — **Fourth Annual Computer-Based Training Conference & Exposition.** Contact: Val Adell, Conference Registrar, Weingarten Publications, Inc., 38 Chauncy St., Boston, Mass. 02111.

MARCH 10-14, DALLAS — **Second International Integrated Services Digital Networks Exposition.** Contact: Danae Fasano, Conference Coordinator, Information Gatekeepers, Inc., 214 Harvard Ave., Boston, Mass. 02134.

MARCH 12-14, DETROIT — **Artificial Intelligence for the Automotive Industry — The Demystification.** Contact: Dale Mason, Technical Activities Department, Society of Manufacturing Engineers, Computer and Automated Systems Association of SME, P.O. Box 930, One SME Drive, Dearborn, Mich. 48121.

WEEK OF MARCH 16

MARCH 17, BOSTON — **Establishing the Executive Workstation.** Contact: Diane Rodgers, DMR Associates, Inc., 57 River St., Wellesley Hills, Mass. 02181.

MARCH 17-21, BALTIMORE — **Basic Systems Analysis**. Contact: Thomas J. Bisacquino, Director of Education, Association for Systems Management, 24587 Bagley Road, Cleveland, Ohio 44138.

MARCH 17-21, MILWAUKEE — **Test Data Acquisition and Processing for Instrumentation Applications.** Contact: John T. Snedeker, Program Director, Center for Continuing Engineering Education, University of Wisconsin at Milwaukee, 929 N. Sixth St., Milwaukee, Wis. 53203.

MARCH 18-21, LAS VEGAS — Check Processing. Contact: Peggy Meyer, Bank Administration Institute, 60 Gould Center, Rolling Meadows, Ill. 60008.

MARCH 19-21, LAS VEGAS — **CDLA Spring Meeting.** Contact: Dianne L. Sims, Manager of Convention Planning, Computer Dealers and Lessors Association, Inc., 1212 Potomac St. N.W., Washington, D.C. 20007.

MARCH 19-21, BLACKSBURG, VA. — **Personal Computer Interfacing for Scientific Instrument Automation.** Contact: Linda Leffel, C.E.C., Virginia Polytechnic Institute and State University, Blacksburg, Va. 24061.

WEEK OF MARCH 23

MARCH 24-26, CHICAGO — **Systems One Conference and Exposition.** Contact: Michael A. Tew, Technical Activities Department, Society of Manufacturing Engineers, P.O. Box 930, One SME Drive, Dearborn, Mich. 48121.

MARCH 24-27, SINGAPORE — **Artificial Intelligence '86 Conference: AI and its Applications — A State of the Arts Review.** Contact: John Tagler, Elsevier Science Publishers, 52 Vanderbilt Ave., New York, N.Y. 10017.

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Ashton-Tate broadens its scope as it enters services market

Esber outlines his firm's strategies, philosophies

Beneath a sharp wit and ever-present smile, Ashton-Tate President and Chief Executive Officer Edward Esber is a shrewd businessman. At age 33, Esber has been credited with transforming Ashton-Tate from a young and fast-growing entrepreneurial firm into a larger and more stable software vendor. Esber recently discussed software industry issues with Computerworld *correspondent Maura McEnaney.*

It has been said Ashton-Tate is in the process of "thrashing" out its core concept. Do you agree with that statement?

I may not agree with the term "thrashing," but I would say that's somewhat true. Right now, we are working to be or be part of the largest computer services company in the business. I would not be so bold today to say we're going to conquer the mainframe world, but it's time for us to broaden our scope. And if that means doing business more like IBM, Hewlett-Packard Co. and Cullinet Software, Inc., then so be it.

What are the challenges that you see Ashton-Tate facing today?

First is the corporate pricing issue. We are seeing increasing activity and partial increasing pressure to really solidify our pricing to corporate America. There continue to be loud cries for one solution, which is site licensing.

Second, there's the issue of copy protection. The industry's efforts here have been an abysmal failure at protecting ourselves from the pirates. And we've been phenomenally successful in getting in the way of legitimate users.

Third is the whole health of the distribution channel. Those channels are not making enough money.

INTERVIEW

Edward Esber, Ashton-Tate CEO

Have the needs of the MIS director changed over the past few years?

They and we are just beginning to understand the implications of personal computers on some of their original concerns. They want products that are designed with mainframe software in mind, instead of bandages. They want real communications capabilities. The industry has been living on bread and water, and it's time we started giving them more than that.

What do you think of the integrated product approach?

The integrated product category will always have a place in the business. A lot of people think the integrated products category has been a failure. But those products got a bad rap.

If the market will give the integrated products category a second chance, Framework II is an outstanding product.

Is Ashton-Tate preparing an artificial intelligence-based product?

There are a lot of AI techniques that we can use on the query side of the data base technology, and that's one of the things that we need to capitalize on.

Will Ashton-Tate continue with Multimate International Corp.'s plans to port its word processing software to the IBM System/36?

We are continuing to work on the minicomputer part of their strategy. Whether that means porting the whole Multimate product onto the System/36, or making products Document Content Architecture compatible or using the System/36 as a file server is still being sorted out. It was a bold and grandiose attempt to move their software up to the mainframe. Multimate's customers were calling for a System/36 product. I believe in listening to your customers as much as the next guy, but I also want to make sure that a customer is willing to put his money at the bar when he orders a drink.

Will Ashton-Tate be involved in more acquisitions this year?

I definitely wouldn't rule it out. We've got several relationships that could lead to acquisitions this year or next. We're discussing several innovative relationships with small companies today. One has always got to rethink the rules in this business because it changes so fast. But I don't see any more acquisitions the size of the Multimate acquisition this year.

Do you think that small microcomputer software companies still can succeed?

I still think there are opportunities for small companies to become big companies. I think that occurs at industry flex points — when new technology is introduced. I also think it's important that the small companies exist. They can move faster than large companies can. They keep us honest and keep us moving our products ahead.

Three or four years from now, when a new spark of innovation hits, there will be new opportunities.

What is your business philosophy?

You always have to rethink the current and challenge the obvious. I look at this organization not like the military rigid triangle — I invert it. I tell people here that they don't work for me, I work for them. I only come into account when they have a problem to solve or a decision to be made that they can't make. They do the work; I provide some guidance, leadership and direction.

Multimate acquisition leaves some execs' futures uncertain

When Ashton-Tate's acquisition of Multimate International Corp. was finalized in December, it marked the beginning of a new era at the nation's third largest independent software company.

The acquisition extended Ashton-Tate's reach beyond the data base market into word processing with the addition of the successful Multimate Professional Word Processor package. It boosted Ashton-Tate revenue by more than $21 million and gave the company an expanded national presence with Multimate's East Hartford, Conn., offices.

Lefebvre, Multimate vice-president

From all appearances, the merger spells more success for Ashton-Tate. But a merger of that size can also spell trouble, analysts say.

"Ashton-Tate must work hard at making sure the acquisition goes smoothly by coordinating its marketing and product development plan," said Thomas Galvin, analyst at Shearson Lehman Brothers, Inc. in New York.

The Multimate acquisition leaves many questions unanswered. Among them is the fate of Multimate founder and Chief Executive Officer Wilton Jones and Executive Vice-President Richard Lefebvre.

When the acquisition was announced, Jones was singled out as an asset to the combined companies. A talented programmer who first sold his word processing program to a Connecticut insurance company, Jones has not been a visible factor in the acquisition. According to Edward Esber, president and CEO of Ashton-Tate, Jones is currently working on advance product development, including Multimate's plans for porting the word processing software to IBM System/36 and System/38 machines. Once considered a top priority for Multimate, the project seems to have faded somewhat since the merger.

Although he has been working with Esber and Ashton-Tate in completing the Multimate acquisition, Lefebvre has not been named to a position within Ashton-Tate. Nevertheless, he appears to be a candidate for the Ashton-Tate presidency should Esber decide to move into the chairman's slot left vacant by the departure of David Cole more than a year ago.

For users, the biggest question to come out of the Multimate acquisi-

See **MULTIMATE** page 136

Ashton-Tate eyes tactics

From page 1

ver City, Calif., to a slick new office building in Torrance, a Los Angeles suburb.

Ashton-Tate's pursuit of the computer services market and its emphasis on large corporate clients first surfaced last year with the introduction of its Corporate Emphasis Support Program (CESP).

The program aims to provide corporations using 25 or more copies of Ashton-Tate products with a variety of services, including direct hot line support, advanced product information and bulk upgrade policies.

"I have been impressed with Ashton-Tate's ability to listen," said Bruce Johnson, manager of the personal computer resource center at Deloitte, Haskins & Sells in New York and a member of Ashton-Tate's Corporate Advisory Board. The board, comprising 17 corporate microcomputer policy and planning executives, is reported to meet periodically to preview and make suggestions on forthcoming Ashton-Tate products.

Company officials maintain that board feedback weighs heavily in product release decisions and has, in fact, resulted in some last-minute changes in products. According to board member Johnson, the pricing structure of the recently announced Dbase III Plus LAN local-area network was changed after negative comments from board members. Ashton-Tate official Karen Orton, director of marketing programs, adds that as a result of CESP input, a spelling checker and a global search-and-replace function were added to Framework II, the company's integrated, multifunction product.

Ashton-Tate's effort to broaden its marketing options beyond its staple of micro date base management tools began with its marketing of the Framework integrated program in mid-1984 and took a more earnest turn with last year's acquisition of word processing leader Multimate. The acquisition, completed in December, was the largest ever in the fledgling micro software industry and came on top of Ashton-Tate's purchase of Framework developer Forefront Corp. earlier in the year. The Multimate acquisition gave Ashton-Tate a leading presence in two of three primary business software categories — data base, which it still dominates, and word processing. The spreadsheet category remains dominated by the industry's largest micro software company, Lotus Development Corp.

Computer Industry section begins on page 170.

In the eyes of its young president, however, Ashton-Tate is no longer competing exclusively in the microcomputer arena. "I view my competition as more than just Lotus and Microsoft Corp." says Esber, named chief executive officer 15 months ago. "My competition is IBM, Soft-

See **ASHTON-TATE** page 134

"Computerworld tops its MIS/DP competition hands down. And it doesn't stop there."

Nora Feldman Gildea
Director of Marketing
IDEAssociates, Inc.
Billerica, MA

IDEAssociates, developer and marketer of IBM PC peripherals and a company with 500% growth during its last fiscal year, first started using Computerworld to reach a selected audience (MIS/DP) with a narrow segment of their product line (LANs and micro-to-mainframe and micro-to-mini communications links). But as the responses started coming in, Nora Feldman Gildea, Director of Marketing, found that Computerworld attracted much more than just MIS/DP professionals.

"We immediately increased our advertising to include our full product line — boards, modems, graphics, mass storage, networks — everything. The responses are coming from Computerworld readers in all six of our audiences: the PC end user, the business manager, the retailer, the OEM and VAR side of the market, and, of course, the MIS/DP executive."

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As Nora confirms, *"The numbers are in. Computerworld tops its MIS/DP competition hands down."*

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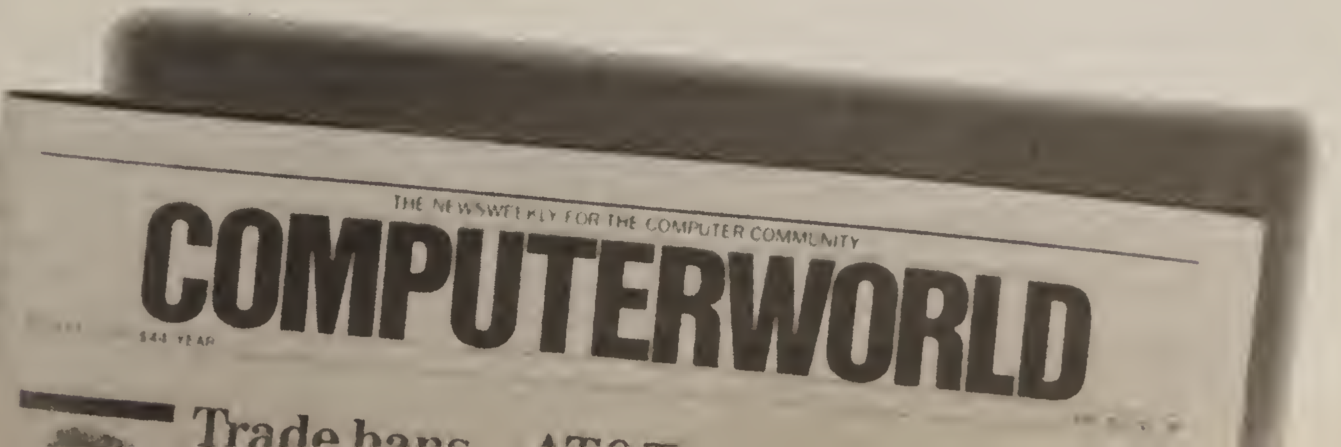


Ashton-Tate eyes tactics

From page 132

ware AG, Management Science America, Inc. and Cullinet Software, Inc. They know how to sell to corporate America and satisfy corporate America's need for service and support."

Other Ashton-Tate executives echo Esber's ebullient credo of making the company the largest service organization in the business. Says company Vice-President Folk: "Large corporations will expect us to be the expert in supplying services the same way they look to IBM to provide support for the software they sell."

Observers say they believe Ashton-Tate is pursuing two courses in its journey into the mainframe world. First, it will port its products onto minicomputers. Toward this end, it reportedly has a contract to port a data base product to AT&T's 3B minicomputer line.

Second, it will enter into joint development agreements with mainframe software companies. Toward this goal, in May of last year Ashton-Tate announced Natural/Connection Version 2 — a micro-mainframe connection between Software AG's Adabas and Dbase III and Framework. Also announced, in cooperation with Informatics General Corp., was Dbase/Answer, which downloads information from several mainframe data bases onto Dbase III Plus and Framework II.

"At the present time we have no intention of building mainframe data base software," Esber avers. "We do intend to work with mainframe software vendors to learn the nonproduct aspects of the business."

Esber also keeps open the prospect of further acquisitions in the coming months although he maintains that none are likely to equal the Multimate purchase in size. "I don't have merger/acquisition mania, but I still keep my eyes open for new companies," he says.

■

The company that Esber now directs has come a long way since his accession to the CEO post in November 1984 and even further since its corporate nativity in 1980.

Founded under the name Software Plus, Inc. by George Tate and Hal Lashlee, the company changed its name to Ashton-Tate — Lashlee-Tate was not considered an appropriate name, and the founders agreed on a substitute when a marketing consultant mistook Lashlee's name as Ashley — with the introduction in 1981 of Dbase II, a data base management software package for the personal computer. Along with such programs as Visicalc, then owned by Visicorp, and Micropro International Corp.'s Wordstar, Dbase II was one of the brightest stars of the microcomputing boom of the early 1980s.

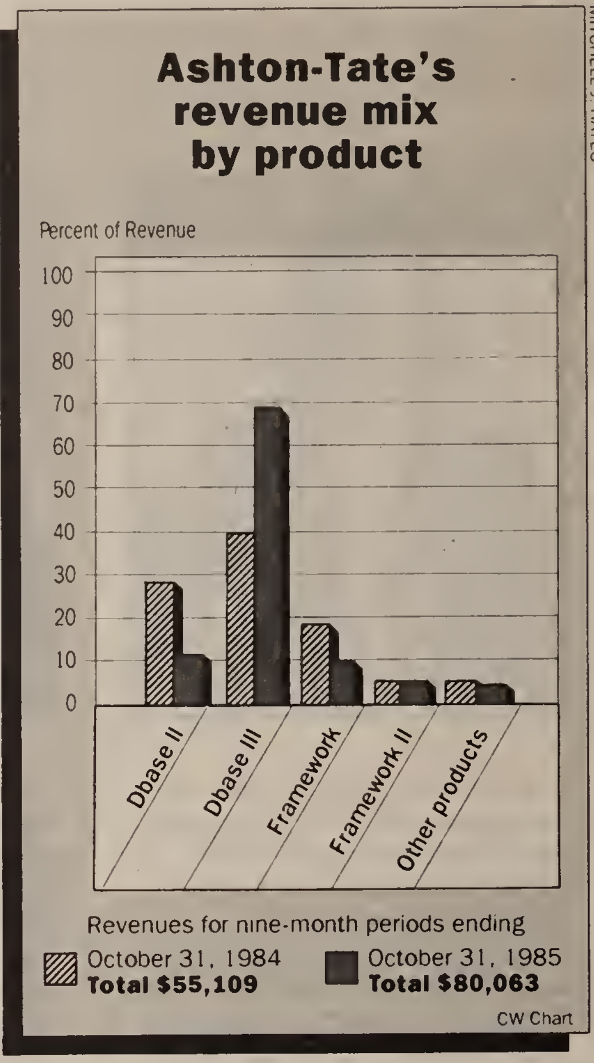
Riding the wave of its popularity, Ashton-Tate went public on Nov. 20, 1983, at a healthy opening price of $14 per share. A year later, the number of installations of Dbase II rose to 300,000 units, from 125,000, and the company was soon ranked as the third largest independent microcomputer software company behind Lotus and Microsoft, according to market research firm Future Computing, Inc. In fiscal-year 1984, revenue jumped from $18 million to $42.9 million.

Although noted for its difficulty to learn and use, Dbase and its programming language attracted a large coterie of self-proclaimed "Dbase loyalists," particularly within the development community. "Dbase II was flexible, more powerful than Basic and Cobol and it allowed applications to be built more quickly," recalls David Irwin of *Data Based Advisor* magazine.

The company had its setbacks, however. Friday, a low-end data base or file management product introduced in July 1983, never amounted to more than 6% of revenue and, Folk acknowledges, "was less than ideal for the low-end user." An integrated applications product, Framework, and its successor, Framework II, have had less than robust sales although Esber claims that Framework and Lotus' Symphony represent a $75 million retail market.

At the height of its success with Dbase II and subsequent introduction of Dbase III, Ashton-Tate was stunned by the sudden death of cofounder George Tate in August 1984. Lashlee had not played an active role in day-to-day operations and just recently resigned from the board of directors to pursue other interests. Two months after Tate's death, the company was further hit by the resignation of then-President, Chairman and Chief Executive Officer David Cole, who accepted an East Coast position as president of the Ziff Corp. publishing company.

Ashton-Tate's revenue mix by product



Revenues for nine-month periods ending

▨ October 31, 1984 **Total $55,109**

■ October 31, 1985 **Total $80,063**

CW Chart

MITCHELL J. HAYES

In November 1984, Esber was promoted from executive vice-president of marketing and sales to take the positions of president and CEO. Esber began his career as an engineer with IBM in 1975 and later joined the consumer products division of Texas Instruments, Inc. In 1979, he linked up with spreadsheet pioneer Visicorp for a three-year stint during which he established that company's distribution network. Esber began consulting for Ashton-Tate in March 1984, and two months later he accepted the position of executive vice-president for marketing and sales. Indications are that Esber will soon take over the chairman's position, vacant since Cole's departure, and name a new president and chief operating officer. One candidate, according to company sources, is Multimate executive Richard Lefebvre (see related story page 132).

Moving Ashton-Tate from its entrepreneurial stage meant adding a staff of professional managers and implementing more operational controls. "The company is radically different than it was over a year ago," Folk says. "We were a one-product company for a long time."

When Folk — also a Visicorp veteran and a partner with Esber in a marketing consulting firm before joining Ashton-Tate formally last August — arrived last year he recalls that the situation bordered on the chaotic. "We didn't have comprehensive budgeting procedures, we didn't understand our cost structure and we didn't have ways to monitor and track the status of product development," he remembers. Today, Folk maintains, things are different.

Users appear to be relatively happy with Ashton-Tate's products and support. Ford Aerospace Communications Corp. in Newport Beach, Calif., is using about 40 packages of Dbase III and approximately 200 copies of Multimate's word processing package. Although the company relies more on in-house expertise than vendor support, "We've had good response from Ashton-Tate with its Dbase III hot line," notes Doug Wolfgram, microcomputer specialist with Ford Aerospace. He is also confident of receiving good support for the Multimate products following the merger.

One user, Don Kendrew, manager of information systems with California Steel, Inc., is not happy about having to wait for an upgrade to the Dbase III Plus product, but nonetheless is very favorable toward Ashton-Tate. His department is running Dbase III on 25 IBM Personal Computer ATs. "The AT and Dbase III were the only two tools that were powerful enough to handle our needs," Kendrew says.

Wall Street and market research companies tend to agree with the positive outlook. For the fiscal year ended Jan. 31, analysts predict Ashton-Tate revenue will be about $115 million and will increase to $145 million after the consolidation of Multimate's operations. "I'm very high on Ashton-Tate, and a lot of credit goes to Esber," said Infocorp analyst Bob Lefkowits.

"Ashton-Tate will emerge as a survivor and a premier vendor," according to Thomas Galvin, an analyst with Shearson Lehman Brothers, Inc. in New York. He predicts the company will earn $1.65 per share for fiscal 1986 and $2.15 for fiscal 1987.

Perhaps the key to success at Ashton-Tate is its plan to change the future

See **ASHTON-TATE** page 136

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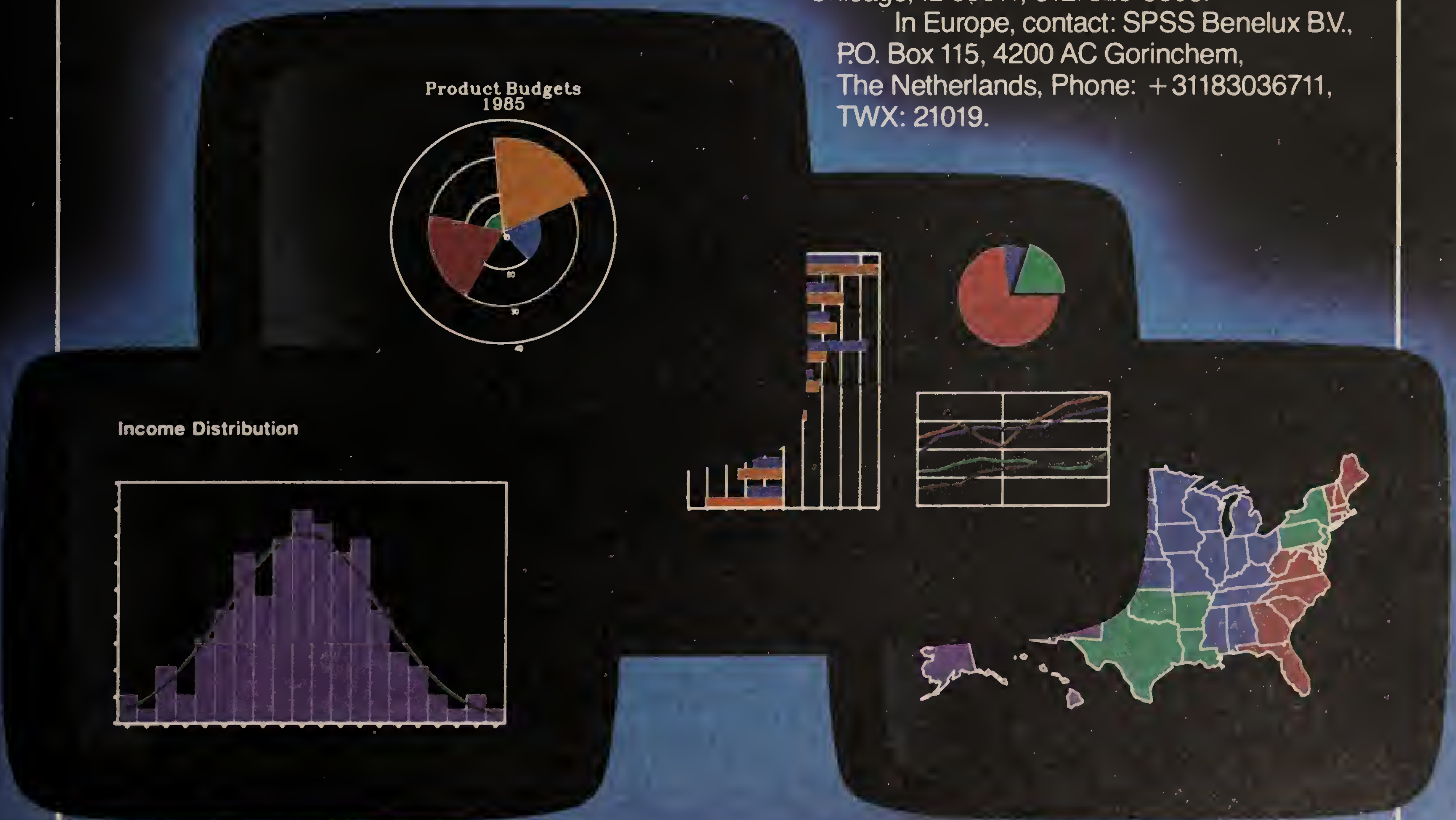

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Ashton-Tate's reputation remains intact after foul-up

Stocks climb even after product recall

TORRANCE, Calif. — On a Monday in mid-January, the shiny new headquarters of Ashton-Tate was brimming with activity. Just more than one month had passed since the microcomputer software company finalized its merger with word processing leader Multimate International Corp. The firm's stock was up at 18⅝, and shipments of the heralded Dbase III Plus had just gone out the door.

Ashton-Tate President Edward Esber smiled that day as he reflected upon his first 15 months at the helm of the third largest independent microcomputer software company in the business.

"This company has come a long way," he said. "We've gone from being an entrepreneurial company to a large growth company."

A manufacturing foul-up

Later that day, Esber learned of a manufacturing foul-up that sent 24,000 copies of Dbase III Plus out the door without networking capabilities — perhaps the most prominent of the product's new features.

Within hours the decision was made to send out overnight letters to dealers and users about the problem. Ashton-Tate offered to pick up the product at its expense and immediately ship replacement products. Customers who bought the product from dealers could call the company directly.

The foul-up did not appear to faze the often fickle investment community or some long-time distributors. On Tuesday, Ashton-Tate's stock climbed to 18¾. The rest of the week, stock continued to rise to 19¼.

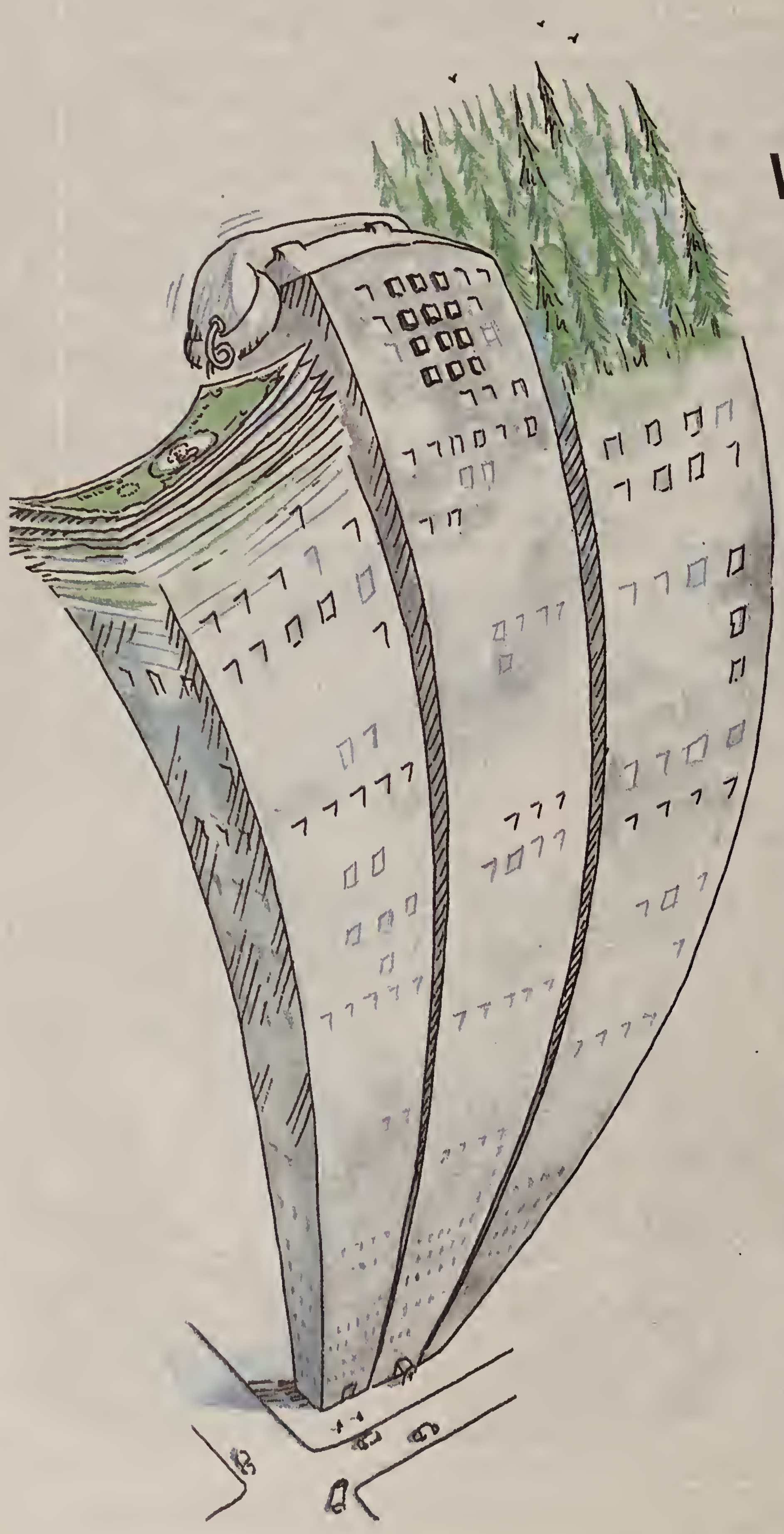
Customers stay loyal

"People are always willing to hang in with Ashton-Tate," said Dan Spiner, president of Management Information Software Co., a New York software distributor. Part of the reason, Spiner said, is the firm's willingness to listen to its customer base.

Ashton-Tate's upgrade policies are one way of keeping the customers happy, according to Spiner. With the upgrade of Dbase III to Dbase III Plus, Ashton-Tate would take upgrades in quantities of 10 for $75 a copy. Upgrading individual packages costs $99. Other companies require users to upgrade 100 packages at a time for a higher price, he said.

"It's the best upgrade policy I've seen in this industry because it's so convenient," he said. "By putting a good product in people's hands you are doing more for them in the long run."

— **Maura McEnaney**



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Ashton-Tate eyes tactics

From page 134

structure of micro software companies. Richard Schafer, publisher of the "Technology Letter," says, "By saying he wants to get into the services business, Esber is saying mainframe software companies have a lot to teach PC software companies about how to do business."

But others aren't so sure. "The more they talk about becoming a services company, the less interesting they become," Schafer said. "It's difficult for me to see how a company that sells low-priced packages can change its revenue structure."

However, for executives like Folk, that will not be a problem. "With our product and services orientations, there is nothing that is going to stop us from becoming a billion-dollar company," he says.

Multimate execs' futures uncertain

From page 132

tion centers on Ashton-Tate's long-promised volume purchase program, seen as the company's response to site licensing. This month Ashton-Tate discontinued Multimate site licensing [CW, Jan. 27] in anticipation of announcing its own policy. A volume purchase alternative is due by the second quarter, Esber said.

Ashton-Tate's first steps toward combining the organization began last month with the integration of Multimate's 36-person sales force. The firm said that the Multimate company and product name has been retained, however.

Under the direction of Chuck Ellison, vice-president of domestic sales, the new Ashton-Tate sales force is aiming to increase its dealer base and wants a 92% penetration rate among dealers for its newest data base product, Dbase III Plus.

"I think you'll see a completely new company in 12 months," Lefebvre said. "Multimate will disappear in the way it existed and so will Ashton-Tate."

— **Maura McEnaney**

Case subsidiary moves to nets

From page 170

results to its U.S. organizational development costs. Reis expects the U.S. operation to return the parent company to profitability by the end of the current quarter of 1986.

To accomplish that, Case went through a significant housecleaning and retraining of the Rixon sales force, as well as aggressive hiring, in the past year. Case more than tripled its U.S. sales force to about 200 people in 1985 and has emphasized a whole new way of doing business. Where selling a Rixon modem to a distributor or OEM was usually a price battle, selling Case multiplexers, protocol converters and switching and net management systems to an end user involves much more.

"The system sale is a value-added pitch, a substantial difference from selling to a distributor. It's a longer selling cycle, but the long-term rewards can be greater," according to Reis.

Reis said he believes deregulation and the search for communications alternatives by corporations creates both large and small market niches for Case products.

"We have competition with IBM and AT&T, but they leave gaping holes for smaller companies like us. We'll never compete with AT&T for central office switches, for example, but we'll do fine in other areas. And, I think IBM sees communications more as an enabling vehicle to sell computers. Their entire data communications equipment sales are less than 5% of their revenue."

Because of its complete systems, Case competes in at least one area against virtually all of the major communications vendors, including Racal-Milgo, Inc., Paradyne Corp., Codex Corp., Infotron Systems Corp., Infinet, Inc. and Digital Communications Associates, Inc. One of Reis' major goals is getting the Case name recognized in the U.S. along with the industry leaders — an ironic challenge for a firm that commands an estimated 33% of the European multiplexer and office network market.

"Case was product-rich with significant technological advantages but without direct representation in 70% of the world market — the U.S.," said R. Neil Barton, an analyst with London-based Robert Fleming Research Service. "At the acquisition date, Rixon had not had time to generate a loyal customer base among the data processing management community, Case's normal market."

Case's British parent company has set the ambitious long-term goal for Case Communications to generate 60% to 70% of its revenue. Since Case Group grossed approximately $117.7 million in U.S. dollars in fiscal 1985, the challenge is clear.

"Not everyone in the data communications industry had a good year, but I think those that haven't been successful failed for specific reasons," Reis said. "There is still a very large pie out there."

Compaq defies industry slump by posting 53% sales increase

By Douglas Barney

HOUSTON — Despite the much-lamented computer industry slump, Compaq Computer Corp. last week reported that its sales for 1985 increased 53% over the previous year, and profits roughly doubled. Compaq also reported an increase in gross profit margin from 29.4% in 1984 to 35.3% last year.

"You couldn't tell that there was a slump by Compaq's results," said Thomas Galvin, a vice-president for Shearson Lehman Brothers, Inc., a New York-based investment firm.

Compaq posted sales of $503.9 million and net earnings of $26.6 million, or 90 cents per share, for the year ended Dec. 31. In 1984, the IBM-compatible micro leader had sales of $329 million and net income of $12.9 million, or 47 cents per share.

According to Rod Canion, Compaq's president and chief executive officer, the increase in profitability was owing to lower costs, including lower component costs resulting from volume discount agreements and product design improvements. Shearson's Galvin said he believes Compaq is moving to reduce costs further by managing inventories more effectively, automating manufacturing and designing cost reductions into products.

Part of the firm's sales growth was the result of new products such as the Compaq Deskpro 286 and Compaq Portable 286, both introduced in April. The firm also introduced the Loral 3100T Compaq Portable 286, which is sold primarily to the government and meets its Tempest security requirements.

In March, Compaq's Dallas-based subsidiary, Compaq Telecommunications Corp., introduced the Telecompaq series of telecomputers that combine computing and telecommunications. Although these products generated less revenue than the firm's Deskpro and Portable computers, Telecompaqs should play a bigger role in the future of the company. "Telecompaq will grow in 1987," said Bruce Watts, first vice-president of Morgan Keegan, Inc., a Memphis-based investment firm.

Analysts said they expect Compaq to introduce later this year products employing new technologies such as the Intel Corp. 80386 microprocessor, which will fuel further growth. "I think you will see them try to broaden their product line at the top end. Those companies that can increase their average selling price do better than those that go in the other direction," Watts said. Compaq increased its research and development spending from $10.9 million in 1984 to $16 million in 1985.

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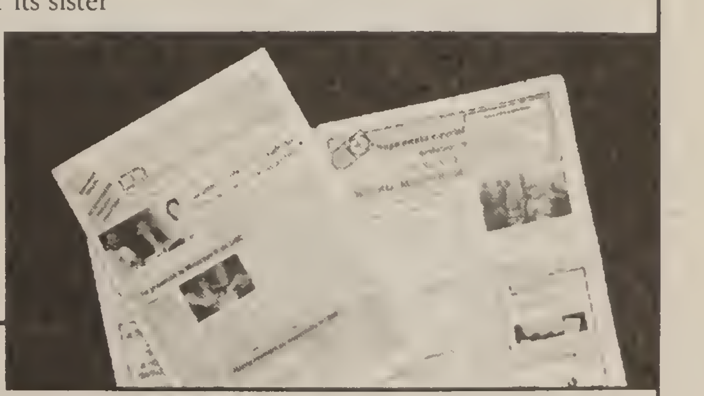

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Gould reshuffles operations in wake of losses

ROLLING MEADOWS, Ill. — In conjunction with posting a $175.7 million loss for 1985, Gould, Inc. announced a major effort to streamline its business by reorganizing its seven operational groups into four primary business units and promoting a number of group vice-presidents to head the new units.

The information systems unit was not affected by the consolidation, but C. Shelton James, who had been group vice-president of information systems, was promoted to executive vice-president of that unit.

The company's semiconductor unit and materials and components divisions have been combined into the materials and components unit. C. David Ferguson, who had been group vice-president of materials and components, was named executive vice-president of the division.

The medical instruments, test and measurement and industrial automation divisions are now part of the instrumentation and automation systems unit, which is headed by John Jones, who had been vice-president of planning and financial services.

Michael Bernath, named group vice-president of the industrial automation systems group, has responsibility for the sales, services and operations. Robert Contino, who had been president of Exxon Office Systems Co., was named president and general manager of sales and service.

For the year ended Dec. 31, 1985, Gould lost $100.8 million, or $2.26 per share, on continuing operations and $74.9 million, or $1.68 per share, on discontinued operations. The total loss included a $160 million charge in the second quarter for inventory write-downs and related charges in Gould's chip and other businesses.

Revenue from continuing operations for the year inched up 1.5% to $1.42 billion. Excluding the $74.9 million charge taken in the fourth quarter, Gould's fourth-quarter earnings were $9.8 million, or 21 cents per share, compared with $23.1 million, or 52 cents per share, a year earlier. Fourth-quarter sales increased 40% to $354.3 million.

Siemens makes mark on OA map

From page 170

mens holds a couple of aces over its U.S. competitors. As factory automation becomes more widespread in the U.S., many U.S. factories are moving into the stage of automation where the diverse islands of automation begin to communicate. GM's MAP, he claimed, is a step in that direction.

Like oil through a refinery

Ultimately, he continued, the manufacturing of a product will be so heavily automated that the product will flow through the assembly process "as continuously and smoothly as oil through a refinery." The technology used to automate refineries is called process automation, and Bardis said parent Siemens AG is a world-renowned leader in that area.

A second Siemens strength on which the U.S. subsidiary hopes to capitalize is the parent firm's large installed base among European factories.

As more U.S. manufacturers undertake European manufacturing, they will be exposed to Siemens products. Bardis predicted that these firms will be inclined to select the same equipment for their U.S. factories.

The year 1986 will mark the beginning of U.S. production of programmable controllers by Siemens-Allis Automation, a move that Bardis said reflects its desire "to be a bona fide U.S. company."

By year's end, Bardis said, the subsidiary will be producing roughly 30% of the programmable controllers that it sells in the U.S. In addition, the Allis name, taken from U.S.-based Allis-Chalmers Corp., will be dropped from the name of the subsidiary. Siemens purchased Allis Chalmers' remaining minority share in the firm in late 1985.

Plans to be No. 3

Although Siemens-Allis Automation opened its doors in Boston's northern suburbs only two years ago, Bardis said the subsidiary plans to capture the No. 3 position in U.S. programmable controller sales by the end of the decade. The subsidiary's pretax revenue, Bardis said, doubled last year, reaching an estimated year-end total of $10 million.

To capture a top spot in programmable controllers, Siemens-Allis Automation will need to wrest some control of that market from the likes of top-ranked Allen-Bradley, which holds a 40% market share, and from second ranked Gould, Inc.

The company will also have to fend off the coming assault of the Japanese programmable controller manufacturers, such as robotics giant Fanuc. "The Japanese trend is threatening to everybody in that market," International Data Corp. analyst Adam Zais said. "I'm not so sure that Siemens-Allis Automation can win the No. 3 spot over a company like Fanuc."

Zais, however, noted that Siemens-Allis Automation is becoming a strong contender, especially with smaller accounts. The continuing surge in factory automation equipment sales, growing 20% annually, bodes well for Siemens, as well as for other vendors in that market.

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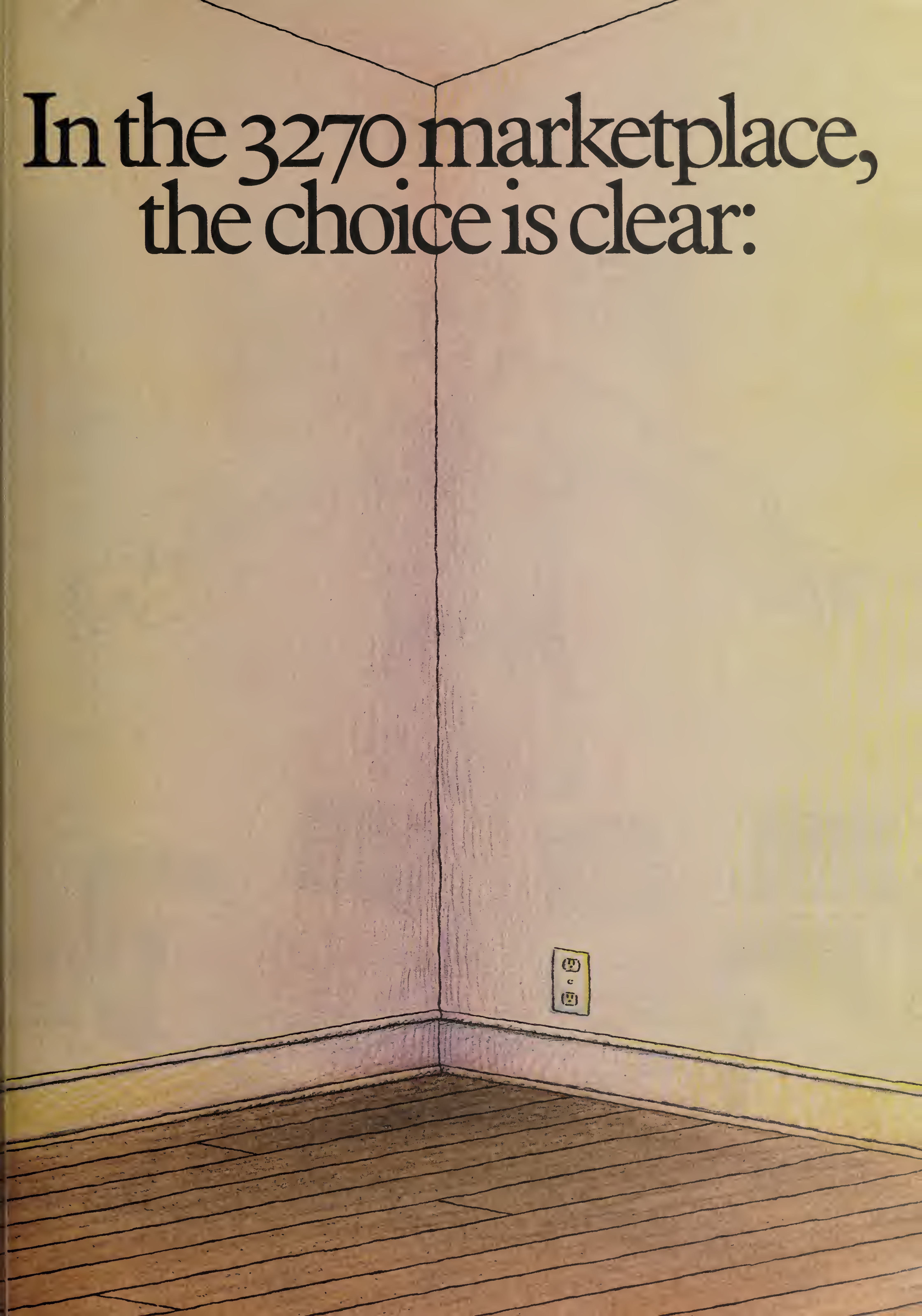
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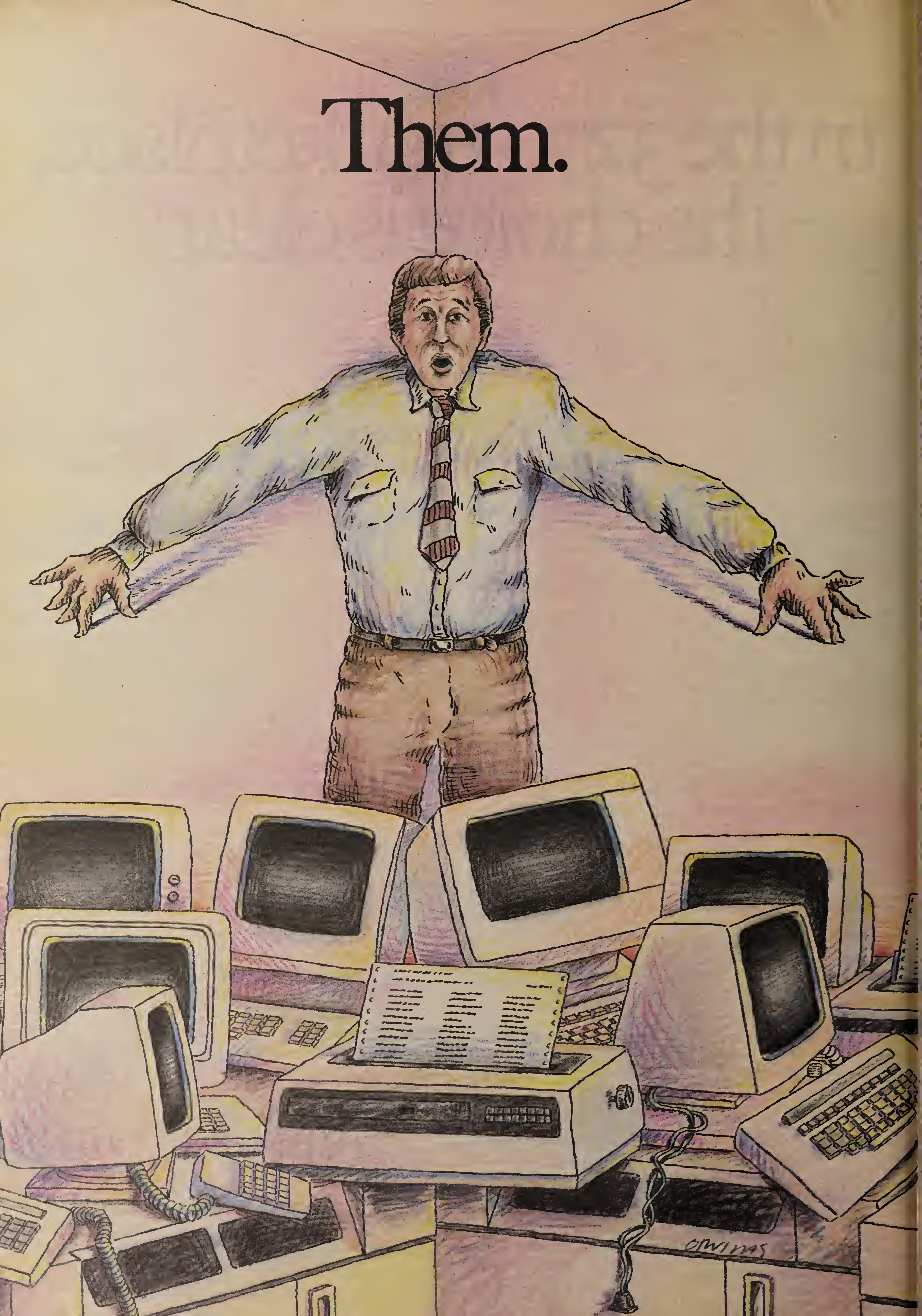
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Federal pacts spur integrators

From page 170

Firms such as IBM and Amdahl Corp. are courting systems integrators and carefully selecting teams of bidding vendors to join, while firms such as Sperry and MCI Communications Corp. are striving to become systems integrators themselves.

"We're trying to transform ourselves from an iron vendor to a systems integrator as fast as we can," according to Jack L. High, Sperry's director of marketing affairs.

Sperry has even abandoned its old rule that only Sperry processors can be bid; now Sperry can bid anyone's hardware, High said. Furthermore, Sperry will soon announce strategic alliances that will improve its ability to offer telecommunications services and IBM-compatible mainframes, he said.

According to IDC's report, IBM views systems integrators as a new channel for getting IBM hardware installed at government agencies. But IBM has had to alter its federal marketing approach because it now must convince the systems integrators, in addition to users, that it has the right technical approach, IDC reported.

Daniel Q. Bandera, program manager at Data General Corp.'s Federal Systems Division, said his firm expects to increase its market share in federal agencies through both value-added resellers and direct sales to users.

The decision about whether to work with a reseller is made on a case-by-case basis, Bandera said.

DG made inroads at the U.S. Department of Justice last month when Tisoft, Inc., a 5-year-old systems integrator based in Fairfax, Va., won a $30 million contract to supply a DG office automation system to the agency's Civil Division.

There has been a rapid expansion in the number of government contracts going to systems integrators such as General Motors Corp.'s Electronic Data Systems Corp. (EDS), Planning Research Corp., Burroughs Corp.'s System Development Corp., Computer Sciences Corp. and Martin Marietta Data Systems. Government figures show that prime contract revenue for these leading systems integrators grew 89% from fiscal 1983 to fiscal 1984, although some of the revenue flows down to hardware subcontractors, IDC noted.

For example, EDS won a 10-year, $223 million contract in October from the U.S. Department of Agriculture for office automation systems and services. Approximately 80% of the revenue will go to AT&T Information Systems, which is supplying the 3B2 minis and PC 6300s. The EDS-AT&T team won a similar contract from the U.S. Customs Service.

Vendors teaming up

In addition to hardware, teams of vendors are winning even more contracts for computer maintenance and services that had previously been awarded piecemeal, IDC reported. At the National Aeronautics and Space Administration, the team of Rockwell International Corp., Bendix Field Engineering Corp. and System Development Corp. won a $685 million support contract last year. The contract consolidates 16 service projects that were once performed separately.

"Three to five years ago, the consolidation of these service contracts, let alone their award to a team of providers, would have been revolutionary," according to the IDC report.

Today, however, information technology vendors are altering their internal organizations, product lines and marketing approaches to respond to the new government climate, the report said.

Ungermann-Bass announces plans to buy Linkware

SANTA CLARA, Calif. — Ungermann-Bass Inc. recently announced plans to acquire fully Linkware Corp., a maker of network applications software in Waltham, Mass., of which it currently owns 22%.

Ungermann-Bass, which said the acquisition is a logical extension of its initial investment, plans to integrate the Linkware applications software with its Net/One and Map/One local-area networks. Map/One, designed for the factory environment, is a product of Industrial Networking, Inc., the joint venture company of Ungermann-Bass and General Electric Co.

Meanwhile, Linkware will pursue its OEM accounts that are not in the factory automation arena. "The bottom line is visibility," according to new Linkware President Wayne Benoit. "Ungermann-Bass is an established vendor. It will answer the question for us of 'How stable are you?' "

Purchase amount undisclosed

Ungermann-Bass plans to purchase Linkware's remaining shares for an undisclosed amount of stock and cash. The agreement is subject to the approval of Linkware shareholders.

Once approved, Linkware will function as a wholly owned subsidiary, Benoit said.

Benoit, who had been the company's vice-president of development, said that Linkware's former president, Larry DeBoever, has been "moved upstairs" and will hold a "strategic planning role."

— **Rosemary Hamilton**

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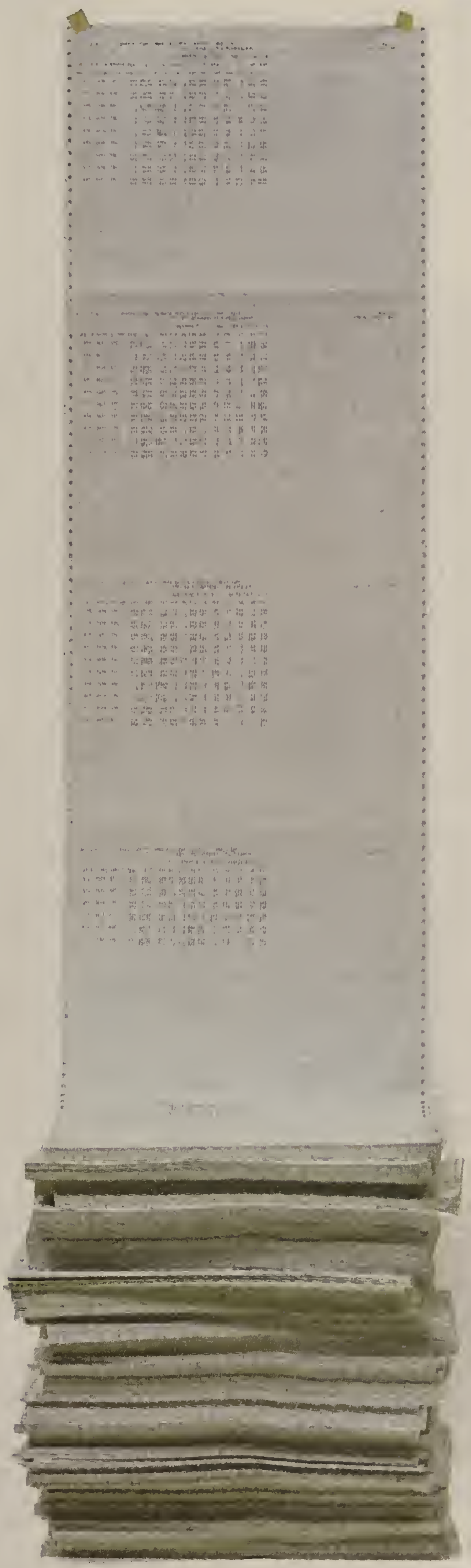

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Commodore gets one-month reprieve on $192 million debt

Firm struggles to repay, fends off Chapter 11

By Edward Warner
Computerworld News Service

WEST CHESTER, Pa. — Commodore International Ltd. recently averted a deadline for payment of the $192 million loan that it has owed to a group of banks since September 1985. Commodore's Vice-Chairman and Chief Executive Officer Marshall Smith said the microcomputer firm has secured waiver extensions of the bank debt through this month.

Paul Lazovick, Commodore's director of stockholder and investor relations, declined to say whether concessions had been made to the consortium of banks that are seeking repayment.

Some analysts wonder if Commodore, a pioneer in low-cost personal computers for the home, will be able to pay off its debts without resorting to protection under Chapter 11 of the Federal Bankruptcy Code. The company suffered badly in the downturn of sales in home personal computers and, in 1985, began a transition that would move its product line to the higher end of the home market. The key product in that transition is the Commodore Amiga, a personal computer that offers sophisticated graphics, a color monitor, 256K bytes of memory and costs $1,900.

The Amiga, however, does not run the software written for its popular low-cost predecessor, the C-64, and so far, only about 50 programs run on it. A hardware product that would have permitted the Amiga to run programs written for the IBM Personal Computer was due out in September 1985 but reportedly will not ship until sometime in March.

In addition, Commodore has met stiff competition from a similarly priced personal computer from Atari Corp., whose owner, Jack Tramiel, was once Commodore's president.

Discussions are continuing with the banks regarding repayment, Smith said. The payment deadline was imposed by the banks after Commodore technically defaulted on the loan in June 1985.

Investor fears that Commodore might not be able to meet the new deadline or that the company might be forced to seek Chapter 11 protection from its creditors caused Commodore's stock price to fall $1.25 to $7.75 in heavy trading on Jan. 30.

"The rumors as to Commodore's bankruptcy are unfounded," Smith said. He said the company expects to post the second highest revenues in its history in the current second fiscal quarter. But Lazovick declined to estimate the company's second-quarter earnings.

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IBM pounces with RT PC

From page 170

fiscal woes looking very different from its meteoric former self, with a leaner payroll, a founder who's off on another venture and strategic partnerships that it hopes will cushion the effect of business cycles on a single horizontal market.

Sun Microsystems, Inc., seeking to marshal its financial resources for a protracted marketing war, announced its initial public offering just three days after the RT PC announcement. And Daisy Systems, Inc. recently created more than a minor stir on Wall Street by disclosing an expected fourth-to-first quarter revenue decline, sending its stock price plummeting.

Executives from the above vendors and others tried to downplay IBM's entry into workstations, saying the Big Blue product is not technologically up to snuff and, therefore, not significant. They were right — and dead wrong.

As any mainframe applications software house — and many users — will attest, the relationship between technical merit and business success in the IBM world is minimal. The "California Technology Stock Letter" called the RT PC "a technological yawn" but noted, almost as an afterthought, "IBM will get their inevitable 25%-plus share of market," not to mention the fallout of delayed purchases by buyers who may not be enamored of the RT but who are certain that IBM will come out with something better in the near future.

Industry scuttlebutt has it that IBM wants this market badly. In a sense, it is a classic illustration of the popular theory that IBM always waits for the innovators to nurture and develop the newest, hottest market then jumps in and clobbers it. And that market, friends, is not laptop micros.

In short, there are some tough times ahead for the marginal, or even not-so-marginal, players in the computer-aided design and engineering workstation game. Look for mergers, diversifications and a spirited jockeying for small market niches. It's the computer industry's all-too-familiar scenario — the shakeout.

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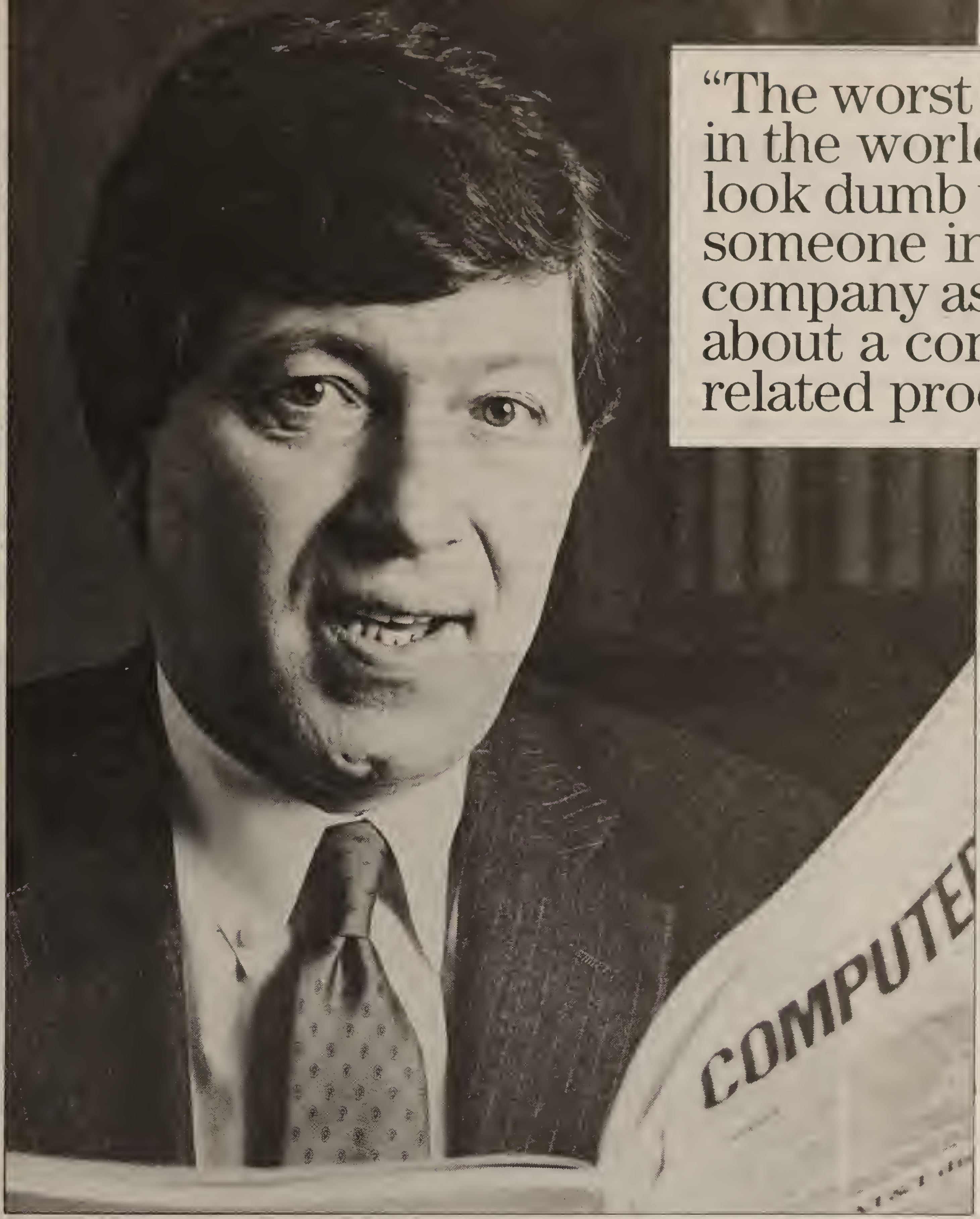

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NICKELS AND DIMES

Software Publishing Corp. announced revenue for the third quarter ended Dec. 31 of $6.9 million, compared with $12.5 million in the corresponding period a year earlier. Profits were $617,000, or 9 cents per share, compared with $2.6 million, or 40 cents per share, in the previous year.

■

Computer Associates International, Inc. announced revenue for the third quarter ended Dec. 31 of $60.1 million, a 55% increase over the $38.8 million reported for the corresponding period a year earlier. Profits increased 38% to $8.6 million, or 78 cents per share, compared with $6.2 million, or 58 cents per share, for the same quarter a year yearlier.

■

Sterling Software, Inc. reported revenue for the first quarter ended Dec. 31 of $69.5 million, compared with $5.1 million a year earlier. Profits were $2.2 million, or 89 cents per share, compared with $239,000, or 5 cents per share, in the like period the previous year.

■

Symbolics, Inc. reported revenue for the second quarter ended Dec. 29 of $27.6 million, compared with $15.7 million a year earlier. Profits were $3.1 million, or 12 cents per share, compared with $815,000, or 4 cents per share, in the like period a year earlier.

■

Lee Data Corp. has announced revenue for the third quarter ended Dec. 31 of $23.3 million, compared with $23.6 million in the year-earlier period. Profits were $1.4 million, or 10 cents per share, compared with $1.6 million, or 11 cents per share, one year earlier.

■

Wicat Systems, Inc. reported revenue for the third quarter ended Dec. 29 of $8.8 million, compared with $7 million in the third quarter a year earlier. Profits were $54,000, or less than one cent per share, compared with the third-quarter loss a year earlier of $2.2 million, or 11 cents per share.

■

Policy Management Systems Corp. announced its results of operations for the year ended Dec. 31. Total revenue, net income and earnings per share for the year were $102.8 million, $14.4 million and 89 cents, respectively, compared with $84.8 million, $13.8 million and 85 cents for the respective periods the year before.

■

Printronix, Inc. reported a net loss of $10.9 million, or $2.22 a share, on revenue of $33.1 million for the quarter ended Dec. 27. This compares with net income of $1.3 million, or 26 cents per share, on revenue of $40 million in the like quarter a year earlier.

■

Xicor, Inc. announced revenue for the year ended Dec. 31 of $34.5 million, compared with $39 million in the previous year. Net loss was $19.5 million, or $1.67 per share, compared with a net income of $4.1 million, or 35 cents per share, in 1984.

■

Visual Technology, Inc. announced a net loss of $33.3 million, or $6.81 per share, on revenue of $24.6 million for the year ended Sept. 30.

The company reported a net loss for the quarter ended Sept. 30 of $17.3 million, or $3.54 per share, on revenue of $4.4 million.

■

Comserv Corp. announced revenue for the year ended Dec. 31 of $28.5 million, compared with $24.9 million in the previous year. Net income was $1.2 million, or 23 cents per share, including extraordinary credits totaling $700,000, or 14 cents per share. This compares with a net loss of $22.6 million, or $6.96 per share, in 1984. The 1984 results included a $12.8 million charge, or $3.96 per share, which resulted from the cumulative effect of an accounting change.

■

Xerox Corp. reported its net income for 1985 rose to $475 million, or $4.44 per share, compared with $290 million, or $2.53 per share, in the previous year.

In the fourth quarter, the company earned $156 million, or $1.49 a share, compared with a net loss of $12 million, or 26 cents per share, in the corresponding period a year earlier.

Parent GM adds to EDS revenue

DALLAS — With General Motors Corp. accounting for the lion's share of its sales, Electronic Data Systems Corp. (EDS) last week reported record revenue in 1985 of $3.44 billion and record earnings of $189.8 million, or $1.57 per share.

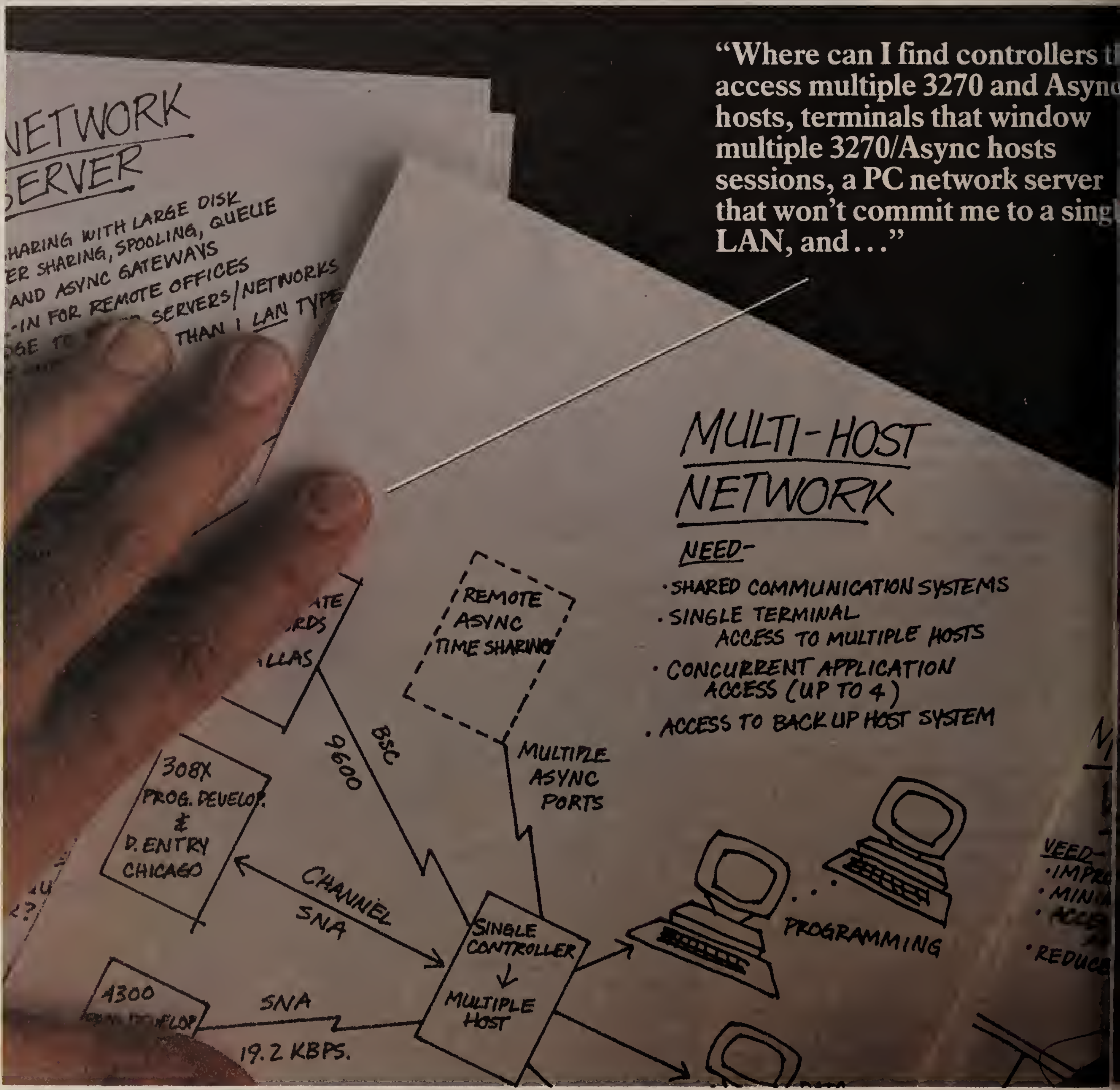
EDS parent GM and its subsidiaries reportedly accounted for $2.43 billion of EDS revenue during the year.

Revenue from contracts with outside customers rose 12.8% to $978.3 million.

In 1984, GM accounted for only $59.3 million worth of data processing services contracts.

Fourth-quarter profits were $57.4 million, or 47 cents per share, compared with $23.2 million, or 19 cents per share, in the year-earlier quarter.

Fourth-quarter sales were $1.08 billion, while revenue from outside customers rose 17.5% to $271.5 million.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Tax credit ineligibility upsets trade group

CBEMA asks legislators to add software to rules

By Mitch Betts

WASHINGTON, D.C. — A computer manufacturers' trade group is upset that the U.S. Department of the Treasury has not issued final regulations that would make software development costs eligible for a 25% research and development tax credit.

Ted A. Heydinger, vice-president of the Computer and Business Equipment Manufacturers Association (CBEMA), urged the department to issue the rules quickly and clear up the matter, which affects the R&D credit that expired last year.

He said companies have run into a catch-22 situation, because Internal Revenue Service auditors are denying the credit for software development activities even though the final rules are expected to approve the R&D credit for software.

"We are very distressed that this delay in issuing final regulations is forcing a number of companies into a stalemate with the IRS," Heydinger said.

"We are forced into time-consuming and difficult confrontations with IRS auditors who insist — with some justification — that the Treasury has not instructed them to include software in the credit," he added.

In January 1983, the Treasury Department held that software was ineligible for the R&D credit, but later officials publicly admitted that the ruling was a mistake. However, the agency delayed issuing the revised regulations while it waited for Congress to address the issue in legislation.

Heydinger argued that the legislative activity in 1985 showed that Congress wants to include software R&D costs. At various times in 1985, the Senate and the House of Representatives voted separately to extend the R&D credit past its Dec. 31 expiration date and to include software development explicitly, but the bills were never enacted into law.

Microstuf files suit against Softklone

By James A. Martin

ROSWELL, Ga. — Microstuf, Inc. has filed a copyright infringement and unfair competition suit seeking a permanent injunction and more than $1 million in damages from Softklone Distributing Corp. of Tallahassee, Fla. The suit alleges that Softklone's communications software product, Mirror, is an infringement against Microstuf's own Crosstalk XVI Version 3.6.

The suit, filed Jan. 27 in U.S. District Court in Atlanta, alleges that Softklone's unauthorized use of Microstuf's registered trademarks and logo violates laws of unfair competition and infringement of the right of publicity.

Softklone advertises Mirror as a "mirror image" or "clone" of Crosstalk XVI and claims that its menus, commands and features "closely reflect" those of Microstuf's flagship product. In addition, Microstuf charges that Softklone's promotional materials for Mirror "prominently display the Crosstalk XVI logo and include a visual comparison of the identical features of the status screens, or main menus, of both products."

Microstuf is seeking a temporary restraining order to force Mirror off the market and a permanent injunction against the company as well. In addition, the company is seeking some $1 million in damages for invasion of rights of publicity and treble damages for alleged unfair competition based on Softklone's profits.

Softklone denied all allegations last week and said the company is vigorously defending itself. "We have infringed nothing of theirs that is copyrightable," said Peter R. Tanzy, corporate counsel for Softklone.

Softklone began operations in August 1985, with shipments of Mirror, its only product, beginning in late December, Tanzy said.

Low demand sparks layoffs

TORONTO — Northern Telecom Ltd. said last week that it will lay off a total of 240 workers in Canada, including 220 at its network access equipment plant in Aylmer, Que.

The Aylmer plant will be consolidated with Northern Telecom's research and development and marketing office in Ottawa. The company will dismiss 20 workers from that office and transfer about 150 to Aylmer.

The layoffs will be effective May 2. Northern Telecom attributed the move to a lack of demand for its transmission equipment. Chairman and Chief Executive Officer Edmund Fitzgerald recently predicted that Northern Telecom's per-share earnings will decline about 20% in the first half of 1986.

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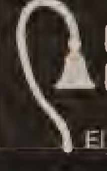

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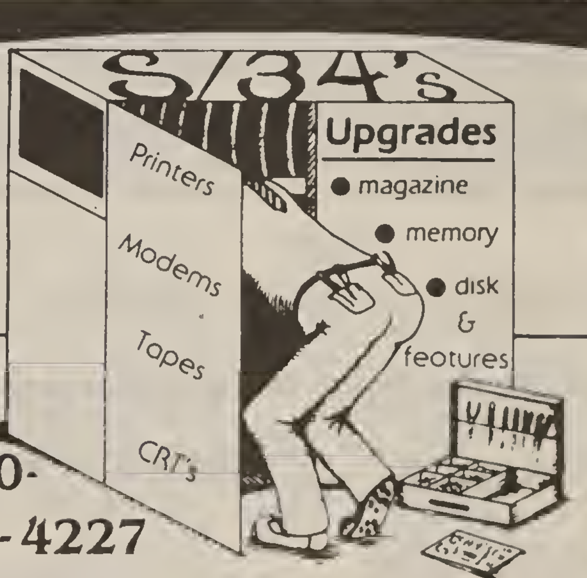

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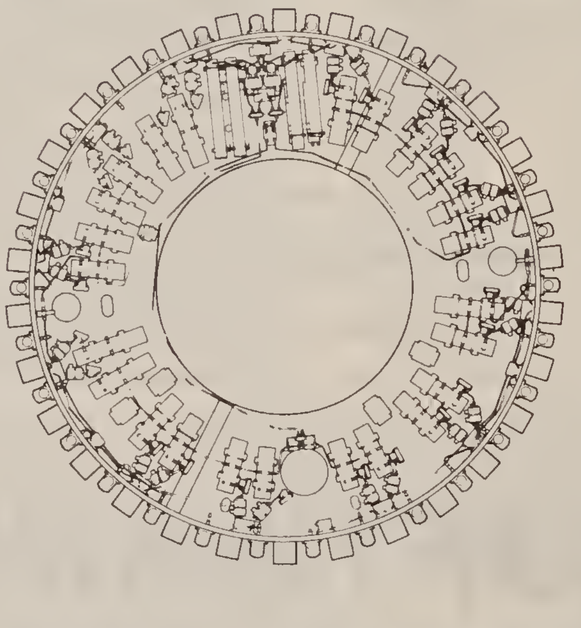

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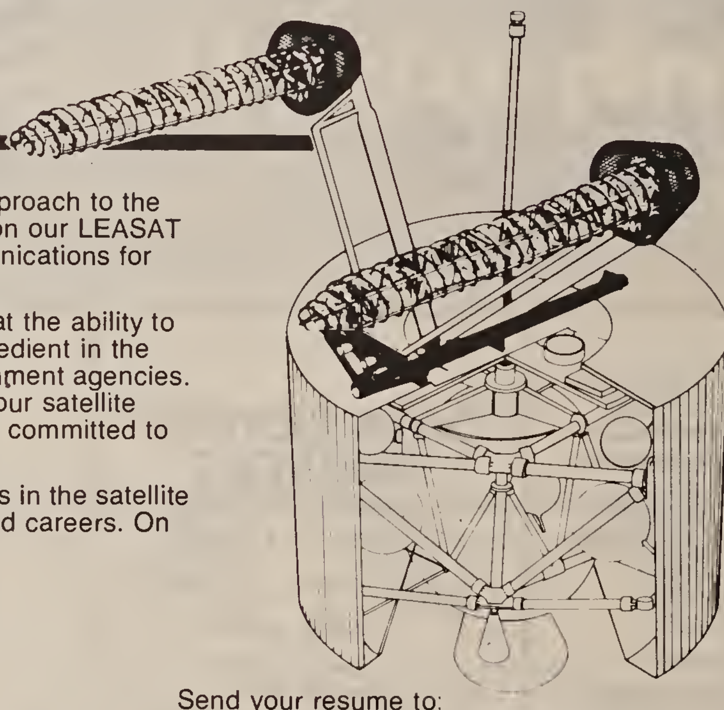

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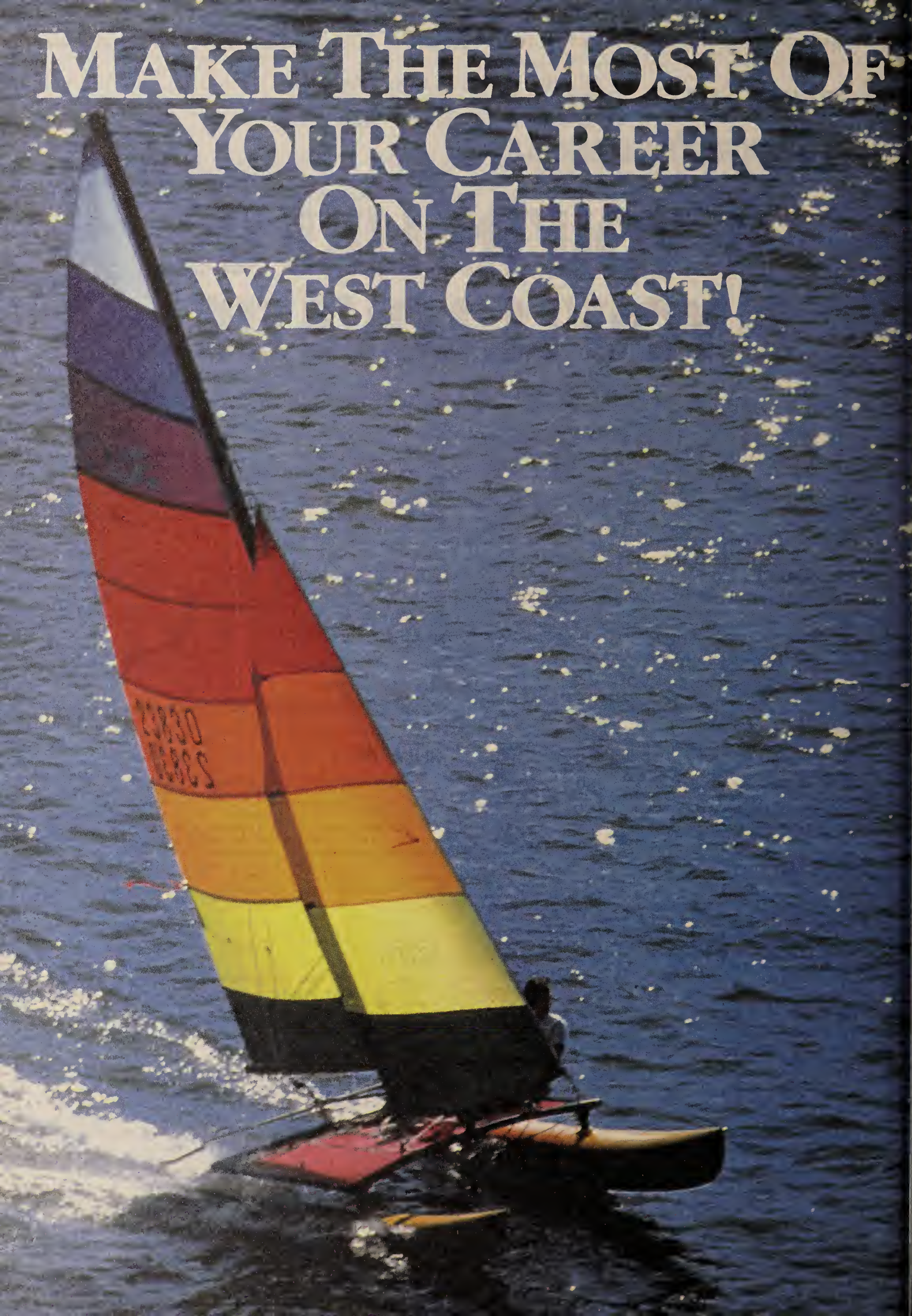
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Consultants — Big "8" Prestige Los Angeles practice of a major Big 8 firm is committed to significant expansion in 1986. Excellent opportunities for senior level professionals with background in manufacturing, financial or administrative systems. To **$55,000.**

FORTRAN Programmer — Business Systems Fast-growing Los Angeles suburban financial firm seeks professional with FORTRAN experience. Company is installing dual computers for on-line transaction-driven systems. To **$32,000.**

Programmer/Analysts — San Fernando Valley Major institution located in a desirable suburban setting north of Los Angeles needs both mini and large systems Programmer/Analysts. Organization provides excellent benefits. To **$38,000.**

COBOL Programmer — South Orange County Well-known, diversified financial services firm seeks professional with a minimum one year COBOL programming experience. Outstanding work environment. CICS, MVS training provided. To **$38,000.**

Programmer/Analyst — Learn Data Base Growing Los Angeles financial company seeks OS/COBOL Programmers who want to learn IMS. Presently developing new IMS systems for all financial applications. To **$42,000.**

Software Development — Minicomputers Successful Orange County minicomputer manufacturer seeks professionals with operating system computer data communications, data base or microprogramming experience. Company is committed to developing and sustaining a complete line of state-of-the-art systems software products. To **$60,000.**

Sales Representative — High Income Orange County office of a leading telecommunications manufacturer is seeking a Marketing Representative with a proven track record of selling business systems. Average Income of sales force last year was over **$50,000.**

EDP Audit Specialist — Extensive In-House Training Fortune 500 organization headquartered in Southern California seeks an EDP Audit Specialist experienced in designing accounting applications in an IBM OS environment. Training in auditing techniques and advanced computing provided. To **$38,000.**

MIS Manager — New Data Center Progressive firm seeks a proven Manager capable of building a data processing organization. Will set direction for successful and growing firm. Suburban Los Angeles community. To **$42,000.**

Manufacturing Systems Analyst — IBM Major Orange County-based manufacturing company has immediate openings for Manufacturing Systems Analyst. Design and implementation of manufacturing systems within an IBM mainframe environment. Opportunity to move into Project Management. To **$45,000.**

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Systems Programmer — Superb Location National company is looking for an experienced OS/MVS Systems Programmer to support their growing IBM 3083 facility. To **$50,000.**

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Project Leader — New Development Major San Francisco financial institution seeks a Programmer/Analyst to lead the development of an Electronic Funds Transfer System in an IBM/OS environment using CICS. To **$41,000.**

Data Base Administrator — Prestigious Firm Silicon Valley manufacturer offers an excellent opportunity for an experienced IDMS Data Base Administrator familiar with the Data Communication facility. To **$50,000.**

Systems Analyst — Large System Environment National consumer electronics firm seeks a proven Systems Analyst with strong manufacturing and accounting experience in a large IBM/OS environment. To **$45,000.**

National Sales Representative International firm located in San Francisco seeks proven Software salesperson to introduce new relational data base package and establish national accounts. Compensation will be structured to the individual. To **$65,000.**

Software Manager — Major Responsibility San Francisco area division of Fortune 500 Corporation seeks shirtsleeves leader of real-time interactive software group. Technical degree and at least 10 years of progressive development responsibility sought. To **$55,000.**

Project Leader — Micro Development Senior Level software engineer to lead mini/micro operating systems development team for new 32 bit processor. Requires five years software development with specific operating systems exposure. To **$55,000 and equity potential.**

Software Engineer — Fast Growth Leading San Jose-area growth company seeks microprocessor software professional to develop systems for the communications industry. Experience with VAX or Gould minicomputer. To **$45,000.**

Software Engineers — Leadership Opportunity Stable firm is seeking a Senior Engineer to lead in the development of Terminal handling software. Four or more years experience in software development using structural methodologies or terminal firmware development a plus. To **$55,000.**

Software Engineers — LISP, Knowledge Engineers Several opportunities exist for experienced LISP and UNIX programmers. Choose your project from applications development, computer prototyping or systems development. Experience in knowledge engineering, symbolic processing or inference engineering desirable. To **$60,000.**

OREGON

Programmer/Analysts — Minicomputers Multiple opportunities for Programmer/Analysts have recently been created for individuals with solid background in BASIC and the PICK operating systems. Will develop new on-line applications for order entry, financial and inventory on minicomputers and then support field installation. Highly creative environment in Portland. To **$35,000.**

Systems Analyst — Growth to Management Utilize your strong verbal and written skills as well as structured design techniques to lead special projects in a pure analyst role for this well-established Portland company. Requires 4 years as P/A and S/A in COBOL with experience in on-line and database very helpful. Additionally desire an individual with solid project life cycle background. Will work on applications supporting General Business and Financial Marketing Systems. To **$36,000.**

Senior Programmer/Analyst — New Development Rapidly expanding Portland manufacturing and distribution firm has new expansion positions for individuals with four years or more COBOL and one year experience with data base systems (IDMS, DLI, ADABAS or ADR). First project in this progressive environment is as team member to implement new Financial and Order Entry Systems. Experience with distributed systems and CICS are helpful. To **$38,000.**

Sr. Technical Consulant Leading West Coast consulting firm seeks individual with above average leadership and communications skills to implement large integrated Business Systems in an IBM environment. Requires solid background as P/A and S/A supporting applications development with on-line and database. Hospital, local government, general business applications are highly desired as is technical background in PCS, CICS or IMS. To **$42,000.**

Software Engineer — Control Systems Well-established Oregon Software systems house recently created several new opportunities for ambitious and creative Software Engineers to work in a small team environment to develop and support microprocessors and minicomputer based control systems. Excellent mix of project leadership, hi-level and functional level design, integrated system development, user interface, etc. Desire five or more years experience with control systems utilizing VAX or HP 1000 minicomputers or microprocessors, plus BS degree. To **$45,000.**

Software Engineers — Hi-Tech Start-up Portland-based hi-tech software firm involved in developing state-of-the-art array processor products and services has multiple opportunities in the areas of Signal/Image Processing, CAT Scanners, CAD/CAE simulations, etc. Requires solid background in Assembler and FORTRAN in the Defense or Electronics industries developing and supporting scientific and engineering applications. To **$45,000.**

Systems Programmer — Unix Design and develop next generation of hardware/software for expanding hi-tech firm in Portland. Will lead design effort using UNIX operating system for a product that supports graphics, data bases and multiple peripheral devices. Experience with logic analyzers, microprocessor or functional board testing is a plus. To **$50,000.**

Sr. Programmer/Analyst — CICS Excellent growth opportunity for an individual to aid in designing and implementing new on-line applications as well as supporting existing systems as a team leader. This solid and progressive Portland firm offers excellent benefits in a state-of-the-art IBM environment. Requires three or more years of COBOL, one year on-line and exposure to Financial and Insurance applications sought. To **$35,000.**

Marketing Representative — System Sales Growth position in Portland to market line of microprocessor and minicomputer systems to OEM's and user account in a verticle market. Highly successful company provides high-quality design and technical support. Seek self-starter with track record of successful hardware and/or software sales. First year potential **$35,000–$50,000.**

Software Engineers — New Product Development Start-up division in a well-established Portland-based, high-technology firm engaged in design and development of high reliability hardware/software systems has multiple opportunities for Software Engineers. Positions exist in graphics applications, telecommunication, data base applications, signal processing, I/O interfaces, diagnostics. Background with UNIX and 'C' a real plus. To **$45,000.**

Sales Representative — Product Support A rapidly growing hi-tech start-up has created an exciting new position to provide sales support and product support for a new "near super computer." Heavy interface in educational and technical marketplace. Requires 5 years experience in large scale scientific and engineering computing applications in pre-sales support, marketing support and product marketing. Knowledge of Cray, VAX, CDC or IBM computers and advanced degree is a real plus. To **$50,000 plus equity.**

Programmer/Analysts — CICS A new subsidiary of a well-established firm has recently created several excellent opportunities in applications development. Selected individuals will work on the design and development of applications to support a Materials Management System in an on-line, large scale environment. Seek 2–4 years of structured COBOL and a minimum of one year of CICS and IDMS. Exposure to YOURDON methodology is a real plus. To **$36,000.**

WASHINGTON

Micro Systems Software — Industry Leader Rapidly growing Seattle-based software development organization has several openings for micro systems software specialists. Position involves design and development of leading edge products such as compilers and operating systems for major microcomputers. To **$34,000.**

IBM Programmer/Analyst — IMS Training Leading Seattle-based Fortune 500 financial organization offers the best in-house training in Seattle and a pleasant, modern working environment. Position requires OS COBOL experience. Relocation assistance provided. To **$28,000.**

Consultant — Systems Seattle office of a Big 8 CPA firm seeks a professional capable of directing its systems consulting activities. Exposure to a broad variety of commercial applications desired. Degree required. To **$40,000.**

Software Engineers — Many Opportunities Highly-regarded Pacific Northwest organization has several real-time ASSEMBLER software development projects to staff. Graphics, SCADA, VAX, CEL, CDC and/or microcomputer skills are preferred. Bachelor's degree required. To **$40,000.**

Programmer/Analyst — Management & CICS Training Rapidly expanding western Washington data processing organization seeks a professional having at least two years of IBM OS/COBOL and VSAM experience to work on information systems. Continued expansion provides excellent opportunities for upward mobility. To **$30,000.**

Systems Programmer Expanding Seattle firm offers state-of-the-art exposure to an experienced IBM OS Systems Programmer. The successful candidate will join the state industry leader while enjoying the unique advantages of the Puget Sound area. CICS, MVS/JES sysgens, internals desirable. To **$45,000.**

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Data Base Analyst Expanding Seattle firm offers state-of-the-art exposure to an experienced IBM Data Base Analyst. A track record in successful IMS Data Base design is sought. Relocation benefits are excellent. To **$40,000.**

Data Base Analyst — Expansion Position Well-established Seattle manufacturing firm is expanding its Data Administration Group. IMS, IDMS or TOTAL expertise required To **$42,000.**

Software Engineers — Growth Opportunity National firm located in Spokane seeks professionals with at least 3 years experience using Assembly or PASCAL on INTEL 8086, 80286, etc. processors. Bachelors degree preferred To **$38,000.**

Operations Manager — Growth Opportunity Rapidly expanding firm seeks professional with solid operations/technical background in IBM 4300, MVS environment. Must have at least 3 years management experience. Degree preferred. To **$40,000.**

Programmer/Analysts — New Development Seattle company is rapidly expanding its Systems Development Department with over 50% new development. Candidate must have at least 2 years experience in IBM MVS, COBOL and CICS. To **$32,000.**

Systems Analyst — Expansion Respected organization seeks professionals with strong technical and analytical background for new projects. Mainframe or mini background with previous programming experience required. To **$38,000.**

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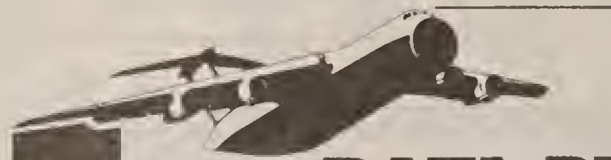

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- **VM/CMS SOFTWARE SUPPORT**–Installation and support of a wide variety of software packages in a rapidly expanding Office Automation and Information Center environment. Minimum of three (3) years' experience in a similar environment under VM/CMS. Hardware—IBM 3081 K.
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You will design and develop advanced telecommunications to support corporate objectives and to ensure cost-effective network systems. A Bachelor's degree in Engineering, Computer Science or a related field is required; Master's degree is preferred. You must have six years professional experience in data communications or computer systems, including three years in data communications planning, development or engineering. Knowledge of communications transport protocols and interfaces is required along with the demonstrated ability to work with broadly defined goals. (Job Code-4)

TECHNICAL ADVISOR/NETWORK ANALYSIS

You will provide technical and operational interface between departments and ensure operational needs are incorporated in development plans and projects of other departments and divisions. You must have a Bachelor's degree or equivalent in Electrical or Electronic Engineering, Math, Physics or Computer Science along with seven years professional experience in large network operating environments with systems development responsibilities. Strong analytical, communications and interpersonal skills are essential. (Job Code-5)

INFORMATION SYSTEMS

SENIOR PROGRAMMER ANALYST

You will design and transform user requirements into an application program for a data processing system. Working on highly complex projects, you will also be responsible for providing technical leadership to junior personnel. Five years programming experience with four years in systems development using COBOL is required. (Job Code-A)

PROGRAMMER ANALYST

You will develop functional requirements and documentation based on accepted user criteria, prepare system test procedures, and work independently on complex projects relative to specific phases of application programming. Three years programming experience with two years in systems development using COBOL is required. (Job Code-B)

For Sr. Programmer Analyst and **Programmer Analyst** positions a Bachelor's degree or equivalent in Computer Science, Math, Engineering or Business is preferred. Previous experience with large-scale IBM systems and IMS DB/DC experience required; experience in distributed data processing systems a plus.

DATA BASE ADMINISTRATION ANALYST

You will design and install IMS data bases for large-scale IBM systems. You must have a minimum of three years experience with two years in systems development and IMS DB/DC experience. Experience preferred in: Monitoring data bases for performance; logical and physical data base design, data base reorganization and recovery procedures and utilities; PSB and DBD creation. Positions available in Memphis and Colorado Springs. (Job Code-C)

QUALITY ASSURANCE ANALYST

You will participate in the development of a quality assurance function to include such areas as: Change control, system test, monitoring of standards and procedures, implementation of a structured methodology and system design reviews. You must have a minimum of three years data processing experience with two years in systems development using COBOL and strong interpersonal skills. IMS knowledge and experience with systems test, design reviews, change control or structured methodology preferred (Yourdon). **Positions available in Memphis and Colorado Springs.** (Job Code-D)

COMMUNICATIONS SYSTEMS PROGRAMMER

You will consult and plan configurations and ensure appropriate hardware/software support for our large ACF/VTAM, ACF/NCP network, supporting such products as NCCF, NTO, NPM, and MSNF. You must have 3-5 years experience in system software support including a working knowledge of MVS, VTAM, NCP, ASSEMBLER, and communication hardware concepts COBOL programming skills and knowledge of communication protocols are preferred. (Job Code-E)

IMS SYSTEM PROGRAMMER

You will maintain and support IMS system software for our IMS Systems Support Group. Activities will include problem resolution, performance tuning, and system maintenance. You must have 1-3 years IMS systems programming experience in a large IMS data base/data communications environment. A knowledge of the internals and externals of IMS is required along with experience with assembler language, SMP, and MVS operating systems (Job Code-F)

To be considered for positions with job codes 1-5, please forward a letter or resume (indicating job code) in confidence to: FEDERAL EXPRESS CORPORATION, Telecommunications/ Electronic Products Division, P.O. Box 727, Dept. 3514-563, Memphis, TN 38194.

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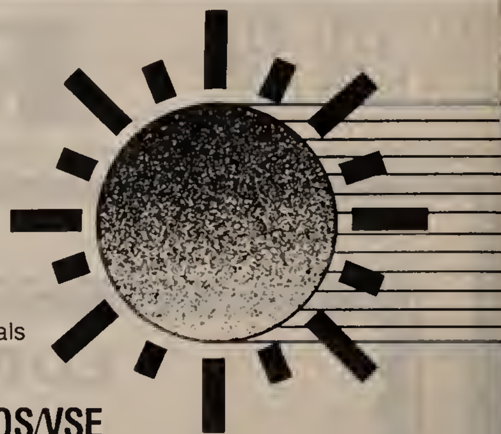

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or send resume to:
Mr. Cy Dougherty, Personnel Director, Software Services of Florida, Inc.

PARAGON CROSSING, SUITE 124, 11300 4TH ST. N . ST PETERSBURG, FL 33702

COMPUTER SCIENCE PROFESSIONAL

The OMAHA PUBLIC POWER DISTRICT, a progressive midwestern utility, is currently seeking an experienced scientific software specialist. The candidate must have qualifications and experience in the following areas:

- MS in Computer Science preferred
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- 5 years FORTRAN related development required

The candidate should be highly motivated in state of the art solutions for engineering and scientific development projects.

We offer an atmosphere that is conducive to professional growth, plus an attractive salary and comprehensive benefit package. If you are qualified and interested in utilizing your talents within a progressive state of the art environment we want to hear from you. Send resume with salary requirements to:

Gloria J. Hill
Omaha Public Power District
1623 Harney Street
Omaha, Nebraska 68102

All inquiries will be kept strictly confidential.

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Telecommunications Consultant

San Francisco

Our San Francisco client is seeking an individual who can consult to systems and product groups for use of data communications technologies. Specific skills should include:

- 3-8 yrs. technical background in data communications.
- Experience with 3705,SNA/NCP, VTAM and networking.
- Budgeting/cost benefit analysis.
- Strong communication skills and interface with Sr. Mgmt.

Excellent compensation package. We are consultants to management. For immediate and confidential consideration, please send detailed resume and salary history to:

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The company is **Superior Consultant Company, Inc.** Healthcare Information Systems Specialists. We provide planning, system selection, project management, training and implementation services to the healthcare community. Our clients include major medical centers as well as vendors of healthcare software. Now operating in major markets in the Midwest, Northeast and Southwest — we are seeking motivated professionals to contribute to success in these and additional markets.

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Qualifications — Superior is seeking promotable professionals able to make immediate contribution to our project management, development, and implementation services. Hospital system experience is a must. Candidates must demonstrate capability in at least three phases of the development cycle — requirements definition, functional specification, technical specification, detail design, programming, test plan, implementation and post-implementation review. Technical experience most desired is with large IBM environments, particularly PCS/ADS. Also desirable is database experience (IMS, DL/1, S-2000, IDMS) CICS and COBOL.

Superior also invites inquiries from persons experienced and interested in long-range information systems planning, cost-benefit analysis, capacity analysis and marketing information system services to the health care industry.

Qualified **SUPERIOR** consultants will possess good communication skills, a results-orientation and an ability to travel.

More information — Please send resume, letter of interest, or call (collect):

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(313) 855-0960

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DEC

Our E. Mass. client seeks an MIS mgr. with 3-5 yrs. mfg. backgrd. It is a VAX/780 VMS environment. Applications are technical and financial. You should have strong managerial and technical skills. Salary to $60K. Send resume to: **Elmer J. Roka or call (617) 235-4670.**

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ELECTRICAL SYSTEMS ENGINEER wanted to design, research and develop electrical systems; direct interface with electrical design group to initiate application of microprocessors to existing product line; and design discrete transformers and printed circuits using CAD/CAE, circuitry, systems analysis, Starplex Development Systems, HP Graphics Software, industry standard computers and test equipment; Requires M.S. degree in Computer Engineering; $32,000.00 per year; 40 hours per week. Send resumes to 7310 Woodward Ave., Room 415, Detroit, MI 48202 Ref. #6286. "Employer Paid Ad".

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Data Processing Consulting

PROJECT-ORIENTED CONSULTING! WHAT IS IT?

It's NOT Contract Programming!

A Contract Programming Shop is basically a temporary help service, supplying programmers to fill short term labor needs. Contract programmers generally get involved only in the late stages of system development, doing what they already know, over and over. And unfortunately, many contract programmers are effectively out of work between assignments. Contract programming is honest work, but it's NOT SEI's work.

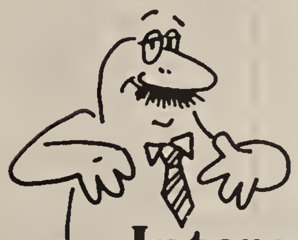
It's NOT Just Management Consulting!

Management Consultants, on the other hand, often get involved only in the earliest stages of system planning and rarely take a direct hand in building the systems that they plan. Our opinion is that this has an unfortunate tendency toward Blue Sky. And, of course, management consultants often miss out on the fun of seeing the systems they plan come to life. Management consulting is a respectable profession, but it's NOT SEI's profession.

So, What IS Project-Oriented Consulting?

Project-Oriented Consulting stands squarely between the extremes represented by Contract Programming and Management Consulting, combining the best features of both worlds. At SEI, our clients look to us for RESULTS—not just plans or code. Yes, we do planning, and our business sense is second to none. Yes, we do implementation, and our technical credentials are nationally recognized.

But more important, we do ALL of those things, and all the steps between. We use technology to solve business problems. We use our business experience to solve them effectively and sensibly.



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(Continued on Next Page) ➡

DIRECTOR OF INFORMATION SYSTEMS

Sacred Heart Corporation in Denver Colorado, a multi-health care system, is seeking a candidate for Director of Information Systems. Responsibilities include system selection, coordination of implementation, user support and facilitation and coordination of modifications. Candidate must possess a computer science degree with 5-10 years health care experience or equivalent as well as strong written, oral and interpersonal skills. Travel required. Send resume and salary requirements to:

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Systems Programmer: You will provide technical support for the Data Center. Position requires appropriate degree and 5+ years experience including large IBM computer systems and MVS/JES 2. Prefer exposure to RJE, XA and CICS. Position reports to Director, Technical Systems.

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Tupperware

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RAND SYSTEMS CORPORATION

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A prestigious service organization located in sunny California is seeking 2-3 year experienced COBOL programmers with solid experience in Group or Life insurance applications on any hardware, or an extensive background in financial applications in a Hewlett Packard environment. The position requires excellent verbal and written communication skills for extensive user interface, combined with outstanding programming and analytical skills. The ideal candidates must be aggressive and willing to accept responsibility for a task from beginning to end. In return, we offer a 37.5 hour week, excellent benefits, opportunities for career training and education, outstanding working conditions, and a highly competitive salary.

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Telephone 404/262-2566

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Computer & Electronics Tech Instructor/Assistant Professor

Marshall University Community College

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Minimum qualifications: Bachelor's Degree in related area; Master's degree in related area preferred; teaching experience and related work experience preferred.

Duties: Teaching computer applications and/or electronic courses plus other faculty responsibilities.

Application Deadline: February 21, 1986.

Send unofficial transcripts and names of three references with phone numbers to: Randy Jones, Program Director, Marshall University Community College, Huntington, WV 25701.

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HEALTH CARE INFORMATION SYSTEMS

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TECHNICON installation personnel provide project management, training and system design guidance related to the installation and support of company products at customer sites. A bachelor's degree in Computer Science, Health Care or a related field is required (experience may be substituted in lieu of educational requirements). Excellent communication skills are required as well as excellent analysis and problem resolution skills. Previous experience in project leadership is required for management positions. Some positions require knowledge of data base management and JCL in a DOS/VSE or OS/MVS environment. Extensive travel is required.

TECHNICON offers stable growth opportunity in a highly professional atmosphere with excellent salaries and competitive benefits. If you feel you can meet the challenge, please send resume and salary requirements to Personnel, Technicon Data Systems, Corp., 5887 Glenridge Drive, Atlanta, GA 30328. TECHNICON is an equal opportunity employer. M/F/H/V. Principles only, please.

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SENIOR STRUCTURAL ANALYST ENGINEER wanted for static and dynamic analysis of automotive bodies and structural components by use of Finite Element Techniques; recommend design changes to optimize structural design; job requires that the engineer design and develop complex Computer Aided Design (CAD) programs for engineering applications using FORTRAN, PL-1 and PASCAL for a Harris 300, PRIME 9750 and Ford Cyber 176 system; Requires M.S. degree in Civil Engineering; and two years related experience as a Civil/Structural Engineer; $30,000.00 per year; 40 hours per week. Send resumes to 7310 Woodward Ave., Room 415, Detroit, MI 48202 Ref. #56685. "Employer Paid Ad".

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- Five or more years experience in the use of planning methodologies, information modeling techniques and tools, or data entity and relational analysis, as it applies to strategic business systems planning, requirements definition, and business systems design.
- Three or more years experience with IMS, IDMS, IDMS/R or DB2 in either applications design and integration or standards development, documentation, testing and capacity planning. Experience in the use of application generators and fourth generation languages is desirable.
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FLORIDA

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The Jarvis Walker Group is presently recruiting for a number of positions that require solid experience with database systems. These opportunities are with client firms located throughout the state of Florida as well as in other cities in the Southeast.

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JARVIS·WALKER

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Tampa, Florida 33614
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Data Processing Consulting

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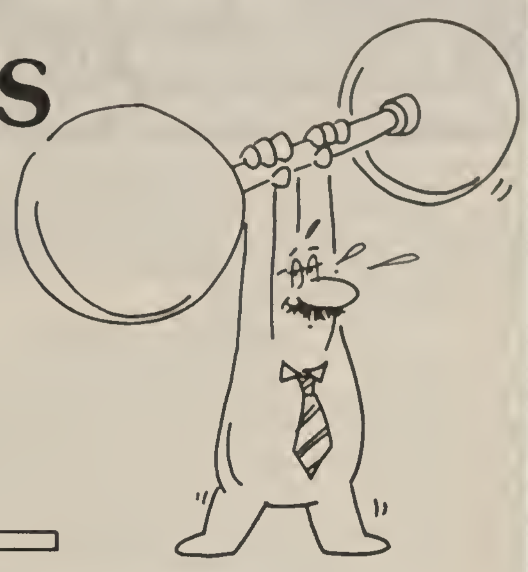

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- Assigning them to demanding, challenging projects that cover the range of planning and development activities for system and application software on mainframes, minis, and micros. SEI builds the basic product delivery systems through which our clients conduct their businesses.
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We look for people who work hard, are eager to learn, are serious about their careers, and who enjoy the variety and challenge of Project-Oriented Consulting. (For more about Project-Oriented Consulting, see our message on the previous page.)

Interested?

If YOU'VE got what it takes to become a STAR, send a resume and salary history to:

SEI Information Technology
Attn: George Appel, Recruiting Coordinator
450 East Ohio Street
Chicago, Illinois 60611

SEI information technology
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(Continued on Next Page) ➡

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We are seeking an individual to be responsible for a new corporate materials management system and work closely with the project team. The ideal individual will have:

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Nash Phillips/Copus

NPC

Attn: Personnel
P.O. Box 14508
Austin, TX 78761

Principals Only

DATA PROCESSING OPPORTUNITIES

At Borg-Warner Chemicals We Give You The Challenge You Need— The Recognition You've Earned!

Our growing MIS department is in an Ohio River Valley location which provides pleasant living conditions in a small city atmosphere with convenient access to several major metropolitan centers. We are a progressive, growth-oriented company and provide excellent benefits and exceptional career opportunities in a professional EDP environment.

Systems Analyst

We are looking for individuals who have a minimum of 5 years' experience successfully designing and implementing large scale on-line business information systems supporting manufacturing, finance, and marketing functions. Successful candidates must possess strong written and verbal skills and be familiar with a structured project development methodology, data base design techniques, and CICS on-line application development. A degree In Business, Computer Science or a related discipline is required.

Programmer Analyst

Qualified individuals will have 3-4 years' experience designing, coding, debugging, and documenting computer applications that operate in a CICS environment using COBOL. Good written and oral communications skills is required. A degree in Business, Computer Science or a related discipline is required.

Systems Programmer

Must have a minimum of 4 years' systems programming experience in MVS, IMS, CICS environment. Successful candidate must have a strong background in Systems Control Programs, IMS, CICS plus proficiency in COBOL and Assembler languages and IBM utility software. A degree in Computer Science or a related discipline is preferred.

Data Base Analyst

Must have a minimum of 3 years' experience analyzing and designing data bases, preferably IMS, in a CICS environment. An in-depth knowledge of OS JCL, VSAM, ISPF, PANVALET and IBM Data Dictionary is highly desirable. A degree in Computer Science or a related discipline is preferred. This individual must have good interpersonal skills, be a self starter, be capable of working with MIS technical personnel and users from the various business functions.

For immediate, confidential consideration, please send your resume to Mr. Neale Williams, Borg-Warner Chemicals, Inc., International Center, Parkersburg, WV 26102.

An Equal Opportunity Employer M/F/H/V

BorgWarner Chemicals

COMPUTER PROFESSIONALS

We've made our move... Now it's your turn!

M.I.S. International and our subsidiary, Autoflex, Inc. have moved our corporate headquarters from Southfield to our new 18,000 square foot facility in Farmington Hills, Michigan.

We're one of Michigan's largest consulting firms; for 16 years, our data processing and engineering professionals have provided services to Fortune 500 firms including major automobile manufacturers and suppliers.

We are enjoying exceptional growth, making this a perfect time for you to move up with one of our subsidiaries or divisions: M.I.S. International (data processing), Micro Computers (hardware/software design and development), Autoflex Inc. (robot systems development) and Engineering Services (automotive engineers and technicians).

Permanent positions are available for professionals with 1 years' experience in:

- IMS DB/DC COBOL
- FOCUS
- HP 3000/TRANSACT
- COBOL TSO/SPF
- CICS with COBOL
- IBM OS/MVS, DB II, SQL
- Series 1/EDX EDL
- PRIME/ORACLE

We offer state-of-the-art working environments, competitive salaries, comprehensive health care coverage, tuition reimbursement, liberal profit sharing, referral bonus, overtime and relocation assistance. For more information, contact Marie Clark or Steve Barber at 1-800-521-2144 or send resume to: **M.I.S. International, 23380 Commerce Dr., Farmington Hills, MI 48024.** Equal Opportunity Employer.

MIS
INTERNATIONAL INC

Farmington Hills • Atlanta • Ft. Lauderdale

SYSTEMS

$35-50,000

We are recruiting on behalf of a major NYC financial institution for

DATA SYSTEMS REVIEW ANALYST

To qualify you must have:

- 4-7 years D.P. experience covering Programming, Design & Analysis.
- A good understanding of new systems development processes & controls
- Conceptual understanding of principles of data communications and Data Base management systems.
- MBA and/or Banking experience preferred.

Send Resume in confidence or call

(212) 288-0351
DALTON MANAGEMENT CONSULTANTS, LTD.
244 E. 75 St., NYC, N.Y. 10021

DATA PROCESSING RECRUITER

Unique opportunity for an entrepreneurial person to establish a brand new professional recruiting firm in the Harrisburg, PA area. Venture capital group seeks the right individual to set-up and operate this company.

An ideal background would be actual experience as a Data Processing Recruiter, or some combination of marketing and staff management in the data processing field.

Compensation is based on performance plus the potential for substantial equity participation through the achievement of goals.

If interested send resume, salary history and a brief (half page) handwritten summary of your thoughts on the most successful approaches to professional recruiting.

Respond to:
Post Office Box 409
Lemoyne, PA17043

Tech Specialists
analysts
programmers

Our clients have challenging career opportunities available now in the

SOUTHEAST

24-hour computerized job listing: modem (704) 554-1102
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EDP PROFESSIONALS
Suite 305, Fairview Plaza One
Charlotte, NC 28210
(704) 554-1101

affiliates nationwide

New England, Westchester & NY Metropolitan Area

PERMANENT &/OR INDEPENDENT CONSULTING

IBM-Group Leaders & Project Mgrs. Any database exp--CICS a must.

Systems Programmers OS/MVS

Second V.P. Hardware Installation & Datacom Protocols. (ground flr oppty)

VAX VMS. Basic. Programmers. 3-4 yrs exp.

IDMS ADSO Applications.

Call Maggie Liptak, 212-307-0939 or submit resume to Interface Inc., 17 West 54 St, NY, NY 10019.

PROJ. MANAGER

RETAIL:
1. P.O.S. $45K
2. MSA A/P $45K
3. Inventory Costing $45K

INSURANCE:
3 project leader positions will manage installations of life insurance systems. Some travel and relocation. $48K.

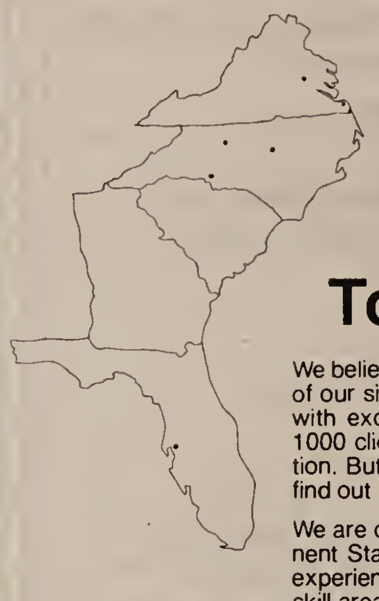
PROGRAMMER/ANALYSTS:
CICS $36K
IMS DB/DC $35K
IDMS $38K

ROBERT HALF
OF HOUSTON
1360 Post Oak Blvd., #1470
Houston, Texas 77056
713-623-4700

BDP Instructor

Okalahoma State University Technical Branch, Okmulgee seeks qualified individuals to instruct students in business data processing courses that can include: systems design, programming languages, EDP Auditing, Command-Level CICS, data communications, and operating systems. Graduate from two year college with major coursework in business data processing and/or bachelors degree from an accredited college with 18 hours in computer information systems. Three years experience as project leader or systems analyst or at least two years additional data processing experience. Must have good communications and leadership skills and proficiency in Command-Level CICS, DL/1 and COBOL. Contact Personnel Office, Okmulgee, OK 74447, (918) 756-6211 xt 54 for application before deadline February 14, 1986. AA/EOE

Programmers/Analysts



Our Staff Members Warm Up To Us Quickly

We believe working in the sunny south at any of our six locations for an Inc. 500 company with excellent benefits, salary, and Fortune 1000 clients can give you a sunnier disposition. But don't take our word for it. Call and find out for yourself.

We are currently looking for full-time, permanent Staff Members with at least two years experience in one or more of the following skill areas:

IDMS ADS/ONLINE
IMS DB/DC
ADR DATACOM IDEAL
CAD/CAM FORTRAN

Positions available at six Professional Services Division offices in Virginia Beach/Norfolk, Richmond, Raleigh/Durham, Charlotte, Winston-Salem/Greensboro, and Tampa.

Please send resume in complete confidence or call collect to:

Personnel Department 116
607 Lynnhaven Parkway
Post Office Box 8888
Virginia Beach, VA 23450
Attn: Patty Ezell
(804) 486-1900

METRO
Information Services, Inc.

Director of Systems Development

Financial and Administrative Systems

Integrated Healthcare Technologies is a leader in the provision of applications software to the healthcare industry. Backed by Travenol Laboratories, Integrated Healthcare Technologies' rapid growth has created the need for this new position.

In this highly visible and fast-paced position you will have the potential for advancement only an industry leader can offer.

We are looking for an aggressive and competent technical manager who demands responsibility and challenge. Requirements include 5 to 7 years management experience in software development in an on-line IBM mainframe environment, and 3 years experience as a programmer of CICS, DL/1 and COBOL. Hospital experience is required along with a BS in Computer Science, related degree, or equivalent. PCS/ADS experience is a plus, as is an MBA.

Integrated Healthcare Technologies offers outstanding benefits and salaries. For consideration, please send your resume with salary requirements or call: Karen Garcia, Human Resources Specialist, (516) 724-9743.

TRAVENOL

Integrated Healthcare Technologies
800 Veterans Memorial Hwy.
Hauppauge, NY 11788

Equal Opportunity Employer

PROGRAMMER/ANALYST -

Design, code, test, document & maintain computer pgms as related to various government utilities. Utilizing COBOL & JCL in DB & batch environments. Proficiency in Assembler is desirable. IBM DOS experience required. NIXDORF 8890 experience is desirable. $22,000, negotiable upon qualifications. Send resume to **Clerk of the Circuit Court, Attn: Terra J. Christensen, Data Systems Manager, P.O. Box H, Titusville, FL 32781-0239, 305-269-8142.**

SYSTEMS ANALYST: Design, develop, test, maintain & enhance computer applications as related to various businesses utilizing JCL, LIBRARIAN, IMS/DB, IMS/DC, TSO/SPF, CLISTS, VSAM/IDCAM, OS & IMS utilities on IBM mainframe hardware. 4 yrs exp or 4 yrs related programming exp. $33,500/yr, 40 hrs/wk. CAP GEMINI DASD. Send resume to CW-B4745, Computerworld, Box 880, Framingham, MA 01701.

SOFTWARE PROJECT MANAGER

Plans, directs and coordinates activities of computer software projects to achieve desired objective within prescribed priorities and time and funding limitations. Interfaces with clients and management to determine requirements and methodology, standards and staffing. Oversees work plan schedules, budget controls and status reports. Responsible for technical presentation and on-line product demonstrations to clients, and software training of users and staff. D.O.T. 189.117-030. Must have MS degree in Computer Science/-Mathematics. 3 yrs. Project Manager and 1 yr. Analyst/Programmer experience required. Salary $34,000 per year, 40 hr. week. Job entails 10-15 overnight business trips within the US per year. Send resume to 7310 Woodward Avenue, Room 415, Detroit, Michigan 48202. Reference #72185. "Employer Paid Ad."

SENIOR COMPUTER DESIGN ENGINEER wanted for static and dynamic analysis of automotive bodies and structural components using Finite Element Techniques; design and develop complex Computer Aided Design (CAD) systems for engineering applications using FORTRAN, PL-1 and PASCAL for a Harris 300, PRIME 9750 and Ford Cyber 176 system; Requires M.S. degree in Mechanical Engineering and one year related experience as a Manufacturing/Structural Design Engineer; $28,500.00 per year; 40 hours per week. Send resumes to 7310 Woodward Ave., Room 415, Detroit, MI 48202 Ref. #56585. "Employer Paid Ad".

Director, Technical Services

GROWTH *means opportunity*

Charter Medical Corporation is the leading innovator in investor-owned hospitals with a growth rate of almost 500% in the last five years. Charter's Information Services Division has been challenged to keep pace with and support this record growth and is seeking an individual to direct its Technical Services Department.

You will be working in an IBM 3083E MVS/XA environment operating in conjunction with our new WANG remote processing systems.

Qualified candidates should have the following:

- *5+ years systems support/programming experience including 3+ years in MVS/XA*
- *Experience in capacity planning, SNA networks, etc.*
- *2-3 years experience managing a team of systems programming professionals in a "production" environment*

Our Information Services Division is committed to quality systems in a dynamic technological and business environment. This position will be located in Charter's corporate headquarters in Macon, Georgia, a beautiful and progressive southern city just one hour south of Atlanta.

We can offer the individual we select exciting career growth opportunities, a highly competitive salary and a comprehensive benefit package which includes an incentive bonus plan and stock options.

If you are interested in sharing in this growth, please forward your resume to:

H. Morrison
Human Resources
Dept. C
Charter Medical
Corporation
577 Mulberry Street
Macon, GA. 31298

CHARTER
MEDICAL
CORPORATION

Equal Opportunity Employer

SENIOR PROGRAMMER ANALYST

Fairchild Control Systems Company, a proven leader in the production of sophisticated fluid systems, currently has an excellent career opportunity.

Must be able to design, develop, and code routines/programs using 4th generation languages in a data base environment. Must have 4+ years experience working with a manufacturing data base. Strong working knowledge of VM/CMS, VSAM, knowledge of COBOL, and DOS/VSE JCL helpful. Prefer BS or equivalent experience. Strong oral and written communication skills. Knowledge of MIMS or other 4th generation languages such as Ramis, Focus, or Mark IV helpful. Experience must be on IBM equipment.

If you are a professional who won't take "no" for an answer, talk to Fairchild about our excellent opportunity and outstanding compensation package.

For immediate consideration, please send your resume to: **Professional Recruiting, Fairchild Control Systems Company, 1800 Rosecrans Avenue, Manhattan Beach, CA 90266.**

You Control the Future

FAIRCHILD
CONTROL SYSTEMS COMPANY

An Equal Opportunity Employer

PROGRAMMER

APPLICATIONS PROGRAMMERS

We are the West Coast's leading life insurance company with an attractive beach city location in the heart of Newport Center's Financial District.

Pacific Mutual has opportunities for applications programmers who possess both a minimum of 2 years of COBOL experience along with a background in large life insurance administrative systems (particularly ALIS & PALLM). Pluses are VSAM, TSO/SPF & DYL 280.

You will interface with user personnel in our ultramodern facility in Newport Beach. We have an ongoing need for top programming talent which offers stability unparalleled in the field. In addition to an excellent starting salary, you will receive a complete benefits package including medical, dental and life insurance, retirement plan, a company matched savings plan and tuition reimbursement

If you have this background, please call (714) 640-3532 or send your resume and salary requirements to: Gene Howard, Human Resources Department.

PACIFIC MUTUAL
Imagination Beyond Insurance

700 Newport Center Dr.
Newport Beach, CA 92660

Equal Opportunity Employer M/F

Sr. Systems Consultant MVS/VM

San Francisco Bay Area

Dynamic company in the financial services industry offers a strategic technical leadership position to the individual who has the following qualifications:

- MVS/VM Internals
- MVS migration planning and conversion experience
- Supervisory experience or demonstrated leadership potential

We are consultants to management. Please send resume to:

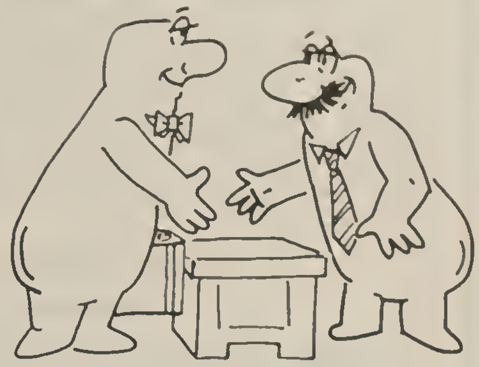
CW-B4744,
Computerworld,
Box 880,
Framingham, MA 01701

Employer assumes fee

Data Processing Consulting

LET'S TALK BUSINESS!

$33,000 - $60,000 to Start!



If our message on the last two pages has intrigued you, you may be a person we need, at one of our offices across the country. Here's what we're currently looking for:

SEI/Chicago is seeking system software and application programmers, with 2-4 years experience in:

- Unix internals: Installation, optimization, porting, customizing
- C Language applications, microcomputer data base systems (e.g., Informix)

SEI/Los Angeles is seeking programmer/analysts, with 1-3 years of experience in any of:

- IBM mainframe Cobol (CICS or IMS a plus)
- Networking: Ethernet, GM MAP, X.25
- Unix and C applications

SEI/Phoenix is seeking applications and software programmers, with 1-3 years of experience in any of:

- Unix and C applications and internals
- IBM mainframe Cobol (CICS or IMS a plus)
- Networking: Ethernet, GM MAP, X.25

SEI/SF Bay Area is seeking communications specialists, minimum 3 years of experience with:

- Unix and C
- Communications software: Ethernet, GM MAP, Token Rings, SNA, Bisync

SEI/New York is seeking applications designers and programmers, with 2-4 years of experience in:

- Mainframe systems and applications, especially information delivery systems
- Investment/Brokerage system experience of particular value

Interested?

SEI offers permanent positions, top salaries, excellent benefits, and unlimited opportunity for growth and development. Send a resume and salary history to:

SEI Information Technology
Attn: George Appel, Recruiting Coordinator
450 East Ohio Street
Chicago, Illinois 60611

SEI information technology

THE BUSINESS OF TECHNOLOGY

– An Equal Opportunity Employer M F –

Unix is a trademark of AT&T Bell Laboratories

Programmer Analyst

Rocky Mountain Bank Note, a leading name in the printing industry, offers a career worth moving for and a place worth moving to. If you're tired of the lifestyle you have, move where the sun shines over 300 days a year and the winter sports abound.

To join our data processing team you'll need a:

- BS/BA in Computer Science or Information Systems
- 1-2 years experience on the SERIES I
- EDX and EDL

In return for these skills we're offering a competitive starting salary and a unique package of fringe benefits.

Don't miss this opportunity to move west. Send resume and salary history to

Rocky Mountain Bank Note
10455 West Sixth Avenue
Lakewood, Colorado 80215
Attention: Human Resources
EOE M/F/H

Administrative Director of Computer & Information Services

Fordham University

Fordham University is searching for a dynamic person to coordinate all university administrative and academic computing systems and oversee the growth and development of communications systems on three campuses. Facilities include 5 network time-sharing systems (1 DEC 2065 & 4 VAX 11/785-s), microcomputer labs, public terminal clusters, and office automation equipment. Responsibilities include development of the long-range plan for information systems and training and support programs for faculty and staff

Qualifications: Leadership abilities and interpersonal skills. Minimum of five years of progressively responsible management experience. Successful experience with VAX systems, time-sharing, and microcomputers

Please send letter of application, resume and list of three professional references to Richard T. Waldron, Search Committee, Fordham University, Bronx, NY 10458

AA EOE

DEPARTMENTAL SYSTEMS ANALYST PROGRAMMER (Exempt)

Applications are now being accepted for the position of Systems Analyst Programmer for the Sacramento Municipal Court District.

SALARY: $31,844 with four annual step adjustments to $38,736

MINIMUM QUALIFICATIONS: One year experience in computer system and procedures, analysis and design, applications programming, testing and implementation, and data processing operations for a medium to large computer system. **NOTE:** A Masters Degree in computer science or a closely related field from an accredited college or university may be substituted for the one year of the general systems analysis and programming experience

APPLICATIONS: Applications are available at:

Sacramento County
Employment Office
Department of Personnel Management
700 H Street,
Room 0750 (Ground Level)
Sacramento, CA 95814
(916) 440-5593

FINAL FILING DATE: Application package must be received at the above address no later than **5:00 p.m.**, *March 7, 1986*

E O E

Our Program Demands Innovative People.

At Fleet Information, we serve the EDP needs of one of New England's largest and fastest-growing financial institutions and those of a variety of customers in industry and government as well. To meet those ever expanding challenges, we're programmed for high growth, continually upgrading and updating our technological environment and constantly searching for innovative professionals – people with the expertise to handle current projects and the foresight to help us prepare for the future.

Programmer – Tandem

The selected candidate will participate in new development and production support for money management and wire transfer applications. At least 1 year of solid experience is required and 2 years is preferred.

Sr. Programmer Analyst – Tandem

Functioning as project leader, this professional will be responsible for analysis and programming for new development and production support in money management and wire transfer applications.

Both positions involve on-line, real-time systems on Tandem TXP's. Working knowledge of Basic, COBOL and Tandem operating environment desirable.

Sr. Systems Analyst – DEC/Tandem

The successful candidate will assume a project leadership role and be instrumental in determining the future data processing direction for new development and production support in precious metals and international applications. Both are on-line, real-time systems, currently on DEC PDP 11/70's with planned conversion to Tandem TXP's.

This is an excellent growth opportunity for an individual with analytical/programming skills and strong leadership ability. Knowledge of Basic and DEC RSTS operating environment is desirable; background in Tandem technology a plus.

For prompt, confidential consideration, send resume to Diane DeCosta, Manager, Operations Center Personnel, 125 Dupont Drive, Providence, RI 02907.

Fleet Information

An equal opportunity employer M/F/V/H

Software Opportunities With A Pacesetter In The Financial Industry!

Chicago Dayton Dallas Orlando Atlanta
San Francisco Los Angeles and other national locations...

Pacesetter/pas'-set-er/ **1**: one who sets the pace or leads the way for others to follow **2**: one who outperforms others in a given area **3**: a leader in a particular field «The company is a pacesetter in providing distributed processing systems to financial institutions.» ***syn*** ISC Systems Corporation

Innovation is the key to being a pacesetter. Our team of professionals has created many industry firsts and set the pace in the design and manufacture of turnkey intelligent terminal systems for the financial industry. Because of their dedication, our growth has been constant. Now, ISC needs more creative professionals.

We are seeking Software Professionals with assembly language programming experience and the ability to work with a system that incorporates a unique Z-80 microprocessor with a sophisticated multi-tasking operating system. Primary responsibilities will include designing and implementing our customized financial application software.

Join the Pacesetter! Set a new pace for your personal growth and receive an excellent salary and benefit package. Opportunities available in Chicago, Dayton, Dallas, Orlando, Atlanta, San Francisco, Los Angeles and other national locations. For more details about these exciting opportunities, call TOLL FREE:

1-800-241-5583

Or, send your resume to: **Mike Robertson, ISC Systems Corporation, 1100 Circle 75 Parkway, Suite 300, Atlanta, GA 30339.** ISC is an equal opportunity employer.

WE'RE CHANGING THE PACE OF BANKING!

ISC

Systems Analyst - Design, develop and implement financial information system running on IBM 3033 under OS/MVS, TSO/SPF with CICS. $35,200 per year, 40 hours per week. BA Computer Science plus 1 year experience or 3 years experience if HSG. DOT. 012.167.066. Mail resume to NYS Job Service, JO # NY8021134, 97-45 Queens Blvd., Rego Park, NY 11374.

PROGRAMMER- Code, test, maintain, & enhance computer programs as related to fin'l institutions. Convert data & business & fin'l problems to flow charts. Analyze work flow chart & apply computer knowl to develop sequence of computer steps. Convert flow chart to computer languages. Test coded program. Must know COBOL, BAL, DATABASE language, BASIC +2, VM/CMS, Assembler, RSTS, RSX. Hardware- IBM 43XX, 3033 & 308X. Req: 2 yrs exp. or 2 yrs related programming exp. Pays $25,000/yr, 40/hrs/wk. Mail resume to NYS Job Service, JO #8017875, 97-45 Queens Blvd., Rego Park, NY 11374. DOT 020162014.

FACULTY POSITION LIBERAL ARTS COLLEGE

Tenure track faculty position starting August, 1986, teaching undergraduate courses in Department of Applied Computer Science with 130 majors in four concentration areas. Ph.D. in related area, M.S. in C.S. and/or related teaching experience desirable, Operating Systems, Data Communications, and/or Data Structures expected, HP3000 a plus. Rank open, competitive salary and benefits. For details and full description contact John F. Kirchmeyer, Chairman, Department of Applied Computer Science, Mount Union College, Alliance, OH 44601, (216) 821-5320 by March 1. Send resume, graduate transcript, and 3 letters of recommendation.

Affirmative Action/
Equal Opportunity Employer.

Systems Programmer - Responsible for maintaining computer software in current and operational status; maintain log of modifications and supportive software, manuals and updates to insure compatibility and operating efficiency; tune systems for maximum performance; write software required to provide accountability and performance statistics of systems. Bachelor of Engineering in Computer Science or 2 years experience may be substituted for college degree. Detailed knowledge of IBM computer equipment at minimum level of 3 years; knowledge of VM/DOS/VSE, CICS, BTAM and DL/I. 40 hr. week, 8-5, M-F, $21,000/year. Send resume to Job Service of Florida, 3421 Lawton Rd., Orlando, FL 32803. Job Order #FL-5286513.

Software and Configuration Control Engineer. Set up and supervise configuration control (CC) procedures and software libraries for development, manufacturing and customer support. Participate on development teams as a software engineer and configuration control advisor. Must have a BS degree in Computer Science. A working knowledge of UNIX, C programming language, development support libraries, configuration control systems, and assembly language on any processor is required. Must have some knowledge of Source Code Control System (SCCS), and system networking and data base. 40 hours per week. Salary $24,000 per year. Reply and send resume to Job Service, 1550 North 200 West, P.O. Box 1339, Provo, Utah 84063. Telephone number (801) 373-7500. Job Order number 189-8269.

Software developer for data processing and systems consulting firm in Columbus, Ohio area. Develop software and support applications for network services. Maintain large software systems already in place. Job involves real time programming in Unix Real-Time-Reliable environment. Deal with large customer data base. Must have Master of Science in Computer Science. Academic background must have included C programming language; Unix based operating systems experience; and courses in advanced mathematics, network architecture and data communications. 40 hr. wk. $40,000 per yr. Send resume with this ad to Ohio Bureau of Employment Services, P.O. Box 1618, Columbus, Ohio 43216. Attn: JO #3015415, L. Ellison.

An Equal Opportunity,
Affirmative Action Employer.

SENIOR COMPUTER SYSTEMS ANALYST wanted to design and develop process control and real time programming software systems for engineering and manufacturing applications using PL-1, FORTRAN and ASSEMBLER languages on the DEC VAX and IBM Series 1 mainframe systems; design and analyze Microchips for engineering applications using Data General mainframe systems; and consult with users to ensure validity of results; Requires M.S. degree in Computer Science; $30,000.00 per year; 40 hours per week. Send resumes to 7310 Woodward Ave., Room 415, Detroit, MI 48202 Ref. #46285. "Employer Paid Ad".

Sr. Systems Programmer

Moore Financial Group, Inc., one of the Northwest's most progressive financial institutions, headquartered in Boise, ID, is seeking a career-oriented professional to assume a senior systems programmer position.

- The selected candidate will be responsible for the coordination of activities involving installation, maintenance and support of systems software, hardware and operational procedures.
- Qualified candidates should possess 2-5 yrs. experience in MVS (preferably XA), CICS, RACF, and ROSCOE/LIBRARIAN. Financial institution and database management system experience preferred.

Moore Financial Group, Inc. offers competitive salaries and benefits. For immediate consideration, please send resume, in confidence to P.F. Struttmann,
Human Resources, Moore
Financial Group, Inc., P.O. Box
8247, Boise, ID 83733. An
equal opportunity employer.
Principals only, please.

MOORE FINANCIAL GROUP

The Computer Systems in Business (CSB) department of Ohio University's College of Business Administration has three position openings to begin Fall 1986. They are as follows:

1. FACULTY POSITION: **SPECIALIST** IN DISTRIBUTED PROCESSING AND OFFICE AUTOMATION
2. FACULTY POSITION: **SPECIALIST** IN DBMS APPLICATIONS
3. **SYSTEM MANAGER** TO SUPPORT INSTRUCTION

For more information contact -

Dr. Arthur J. Marinelli, Chairperson
Department of Management Systems
College of Business Administration
Ohio University
Athens, OH 45701
(614) 594-5165

The State of Ohio has named CSB a "Center of Excellence". O.U.'s College of Business Administration is fully accredited by AACSB.

SYSTEMS ANALYST

Gurney Seed & Nursery Company in Yankton, South Dakota is seeking a Systems Analyst in its state-of-the-art computer shop. Located on the banks of the Missouri River and near Lewis and Clark Lake, Yankton offers exciting outdoor recreation opportunities including fishing, boating, camping, swimming and biking. Requirements for the position include experience in COBOL, BAL, CICS command level coding in a DOS/VSE environment and a proven record in project management and system design.

Gurneys offers a comprehensive benefit program and salary commensurate with experience. Please send letter of application and resume to Personnel Department, Gurney Seed & Nursery Company, Second & Capital St., Yankton, SD 57078. An Equal Opportunity Employer.

Programmer-Analyst-Develop, write, implement programs. Modify programs. Thorough knowl programming/operation IBM mainframe system. Maint. Test for accuracy. CICS, Cobol, VSAM $35,200 yr. 9 - 5pm 40 hrs. 2 ½ yrs Exp Bach Eng. or Comp Sci. Send Resume to: NYS Job Serv. 2 Bklyn Ave, Freeport, NY 11520 DOT # 020167018 JOB # 0600217

SYSTEMS PROGRAMMER

to $40,323 (DOE)

Requires experience in design/maintenance of operating system software. Prefer IBM mainframe, MVS, CICS and extensive ADABAS/NATURAL Data Base Admin., exp for current vacancy.

Send resume to Ronald A. Hernes,
State Personnel Division,
1831 W. Jefferson,
Phoenix, AZ 85007

Computer Programmer - Develop, write and implement new computer programs in WANG COBOL, COBOL 74 and Advanced Basic Languages; modify, maintain and convert programs currently in use; test programs and correct programming errors. Work performed on WANG VS, IBM PC/AT and IBM/XT microcomputers and IBM-43XX mainframe systems. Bachelor's degree in Computer Science, Mathematics or Engineering plus 3 years programming experience required. 36.25 hours per week, $32,300 per annum. Send resume to New York State Job Service, J.O. #NY8014768, 97-45 Queens Blvd., Rego Park, NY 11374.

IMS-DB2

Systems Programmers

Fortune 50 corporation located in Princeton, NJ, has two openings for IMS DB/DC-DB2 Systems Programmers. Multi 3090 MVS/XA CPU environment. Centrally located in the fastest growing high tech corridor in the country. Midway between New York and Philadelphia. Highly visible position. Full relocation package. Send resume and salary requirements to: Bill Argust, Data Processing Department, 2667 Nottingham Way, Trenton, NJ 08619, (609) 586-0502.

Programmer/Analyst - Analyze complex problems; assist in design, development and implementation of commercial computer software applications. Use IBM 3000 Series, COBOL, JCL, VSAM, TSO/SPF and ASSEMBLER. Bachelor's degree in Computer Science/Math. 2 years experience doing above. 40 hours per week. $48,000 per year. Mail resume: New York State Job Service, JO#NY8017862, 175 Remsen St., Brooklyn, NY 11201, DOT 012.167.066.

PROGRAMMER/ANALYST

Design, analyze and program computer system. Requires Bachelor's or equivalent (9 months professional experience acceptable in lieu of each academic year) in Data Processing or Computer Science and 3 years experience including IMS, OS/ASSEMBLER, COBOL, RPG II, DL/1, MVS, OS/VS1. Job location Los Angeles. Salary $33,000 per annum. Resume to Ron Roark, Vice President, 3400 West 6th St., Suite 209, Los Angeles, CA 90020.

S/38 PROGRAMMER ANALYST

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Osborne ordered to liquidate

Company still seeks funds for operations

By Douglas Barney

SAN FRANCISCO — Osborne Computer Corp., the pioneer of portable computing that sought protection from creditors in August 1984, last week defaulted on its reorganization plan, and a bankruptcy court ordered the firm's capital equipment and inventory to be liquidated. Company officials, however, are still seeking funding to continue operations.

"We are not liquidating the company, we are liquidating the assets. Our shareholders are still there, and our distribution and our licenses are still there," said Ronald J. Brown, president of Osborne.

In an attempt to save the firm, Osborne officials made a proposal to creditors and are trying to raise $1 million to $5 million through the sale of Osborne stock to institutional investors in Europe.

"If it turns out that we can't make a deal with the creditors, or if it turns out that our financing isn't going to come through, then that is another story," Brown said.

One option at that point would be the total liquidation of the firm, he added.

Even when its assets are sold, Osborne can continue to manufacture its desktop and portable micros because all production has been subcontracted to plants in the Far East.

Osborne was founded in 1980 by charismatic Englishman Adam Osborne. Based largely on the success the Osborne 1 portable computer, sales ballooned from $6 million in 1981 to $70 million in 1982.

By February 1983, however, creditor demands forced the company to seek protection under Chapter 11 of the Federal Bankruptcy Code. The company emerged from Chapter 11 in January 1985 but still remained under jurisdiction of the court.

INDUSTRY NOTES

Intel's losses expected to increase

Intel Corp.'s loss for the current quarter will be even worse than the record $15 million loss for the fourth quarter, the firm reported last week. "The depressed industry conditions that characterized 1985 are continuing," Intel told underwriters handling **IBM**'s potential offer of bonds convertible to Intel stock.

■

IBM President and **Chief Executive Officer John F. Akers** vigorously defended his company's business in **South Africa** in a speech at **Harvard University** in **Cambridge, Mass.**, last week. "Participation in a society gives you an opportunity to influence and is much more effective than departure," Akers said.

Two systems vendors announced name changes last week. **Four-Phase Systems, Inc.**, acquired four years ago by **Motorola, Inc.**, will become **Motorola Computer Systems, Inc.** on **April** 7. And **Docutel/Olivetti Corp.** will become **Olivetti USA**. Italy's **Ing C. Olivetti & Co.** acquired Docutel as a wholly owned subsidiary in **August** 1985.

■

AT&T Technology Systems, Inc. has purchased a minority interest in **Thesys Memory Products Corp.**, a maker of memory systems and associated software in **Scottsdale, Ariz.** Thesys will purchase memory devices from AT&T over a five-year period and incorporate them into its product line.

Microsoft stock goes public

From page 170

depending on revenue estimates for the company's recent acquisition of Multimate International Corp.

Microsoft's stock "would bear a premium because of its age and diversity," said William Coggshall, president of industry research firm Software Access International, Inc.

Microsoft, which announced its first corporate acquisition last month [CW, Jan. 27], is now more likely to buy other companies, Coggshall predicted.

"Long term, they're in the strongest position of any of the independent software companies," said Robert Lefkowits, director of software research at Cupertino, Calif.-based Infocorp. "Everyone has to come to them for an operating system to maintain compatibility with IBM."

According to the prospectus, about 55% of Microsoft's revenue in the year ended last June 30 came from system and language software sales, with about 39% from applications and the rest primarily from hardware and books.

In the six months ended Dec. 31, Microsoft's net income was $17.1 million on sales of $85.1 million, the prospectus said.

Of the 2.5 million shares to be offered, 500,000 will be sold by current shareholders. Gates said he plans to sell 80,000 shares in the initial offering, which would bring him between $1.28 million and $1.52 million. He will retain 11.1 million shares for 44.9% ownership of the firm. Cofounder Paul Allen will sell 135,000 shares for approximately $2.3 million. He will hold onto 6.3 million shares, representing a 25.2% stake.

The prospectus also discloses that Kazuhiko Nishi, vice-president for new technology, and Bill Roland, vice-president of the hardware division, both recently left Microsoft.

Nishi, involved in Microsoft's marketing in Japan, owes Microsoft $509,850, which the firm said it does not expect to be repaid.

Senior writer Peggy Watt contributed to this report.

Some advice on how to keep those margins straight

ACTIVE ISSUES
Kathy Porteus

The concept of margins is well understood by accountants and financial analysts but often confusing to individual investors. Confusion stems in part from abundant references in investment reports and the financial press to a company's profit margin, improving margins or margin pressures. Such references assume, often mistakenly, the reader's familiarity with how various margins are calculated.

There are four types of margins — gross, operating, pretax and net profit — that commonly appear in analyses of corporate income statements and that are each considered an indication of a company's profitability.

Gross margins represent the relationship between a company's revenue and the cost of goods sold or services provided. For example, National Semiconductor Corp.'s gross margin for its fiscal year ended May 31 was 29.6%. This figure is calculated by subtracting National Semi's cost of goods sold, also referred to as "cost of sales," from revenue and dividing the difference by revenue — $1.788 billion minus $1.259 billion, divided by $1.788 billion.

A company normally includes its depreciation and amortization expenses in the cost of goods sold. An investor or analyst can check the exact amount of depreciation by looking in the firm's annual report under the heading "Consolidated Statement of Funds Flow" or "Changes in Financial Positions."

Sometimes, as in the case of Value Line, Inc. or Standard & Poor's Corp. research, depreciation is subtracted from the cost of goods sold before calculating gross and operating margins. In the example above, such a practice would change National Semiconductor's fiscal 1985 gross margin to 37.6% . According to Value Line, most analysts include depreciation in the cost of goods sold, as is reported on a company's income statement.

Gross margins are useful in income statement analysis because they indicate the level of a company's manufacturing efficiency. The cost of goods sold reflects all production costs, including labor. To determine how well a company controls the many expenses associated with operating its business, analysts calculate **operating margins**.

On income statements, operating expenses are generally described as costs of goods sold, selling, general and administrative expenses, as well as research and development costs.

To calculate the operating margin for National Semiconductor, fiscal 1985 operating costs are totaled and subtracted from revenue — $1.788 billion minus $1.728 billion. The difference is then divided by revenue — $60 million divided by $1.788 billion equals 3.4%.

When analysts discuss margin pressures or margin improvements, they usually refer to operating margins. When expenses are not in line with revenue, as was the case with many computer and component manufacturers during the first half of 1985, the deficiency shows up in operating margins.

Pretax margins reflect a company's profit or earnings before taxes but after interest income or expense.

For example, IBM's pretax margin for its fiscal year ended Dec. 31 is 23.2%. To arrive at this figure, IBM's earnings before taxes — $11.62 billion — are divided by revenue — $50.06 billion.

Perhaps the most familiar margin in income statement analysis is **net profit margin**, which is simply a company's earnings, after all expenses and tax provisions, divided by revenues. IBM's fiscal 1985 net profit margin is 13%.

Porteus is president of Strand Research Associates, a Centerville, Mass.-based company that provides customized research services for financial and high-tech firms.

Quantum sues Mountain, NEC

By Douglas Barney

MILPITAS, Calif. — Quantum Corp., manufacturer of the Hardcard 10M-byte hard disk drive expansion card, last week filed suit for patent infringement against Mountain Computer, Inc., NEC Corp. and NEC Information Systems, Inc.

The suit, filed in Federal District Court in San Jose, Calif., alleges that the NEC D3126 3½-in. disk drive and the NEC D5126 5¼-in. disk drive, both of which Mountain Computer uses in its Drivecard, violate Quantum's patent for similar technology used in Quantum's Hardcard.

In addition, Quantum is charging that NEC and Scotts Valley, Calif.-based Mountain Computer willfully infringed upon the Hardcard trademark in product advertising.

Quantum is seeking unspecified treble damages and an injunction against further alleged infringement, the company said.

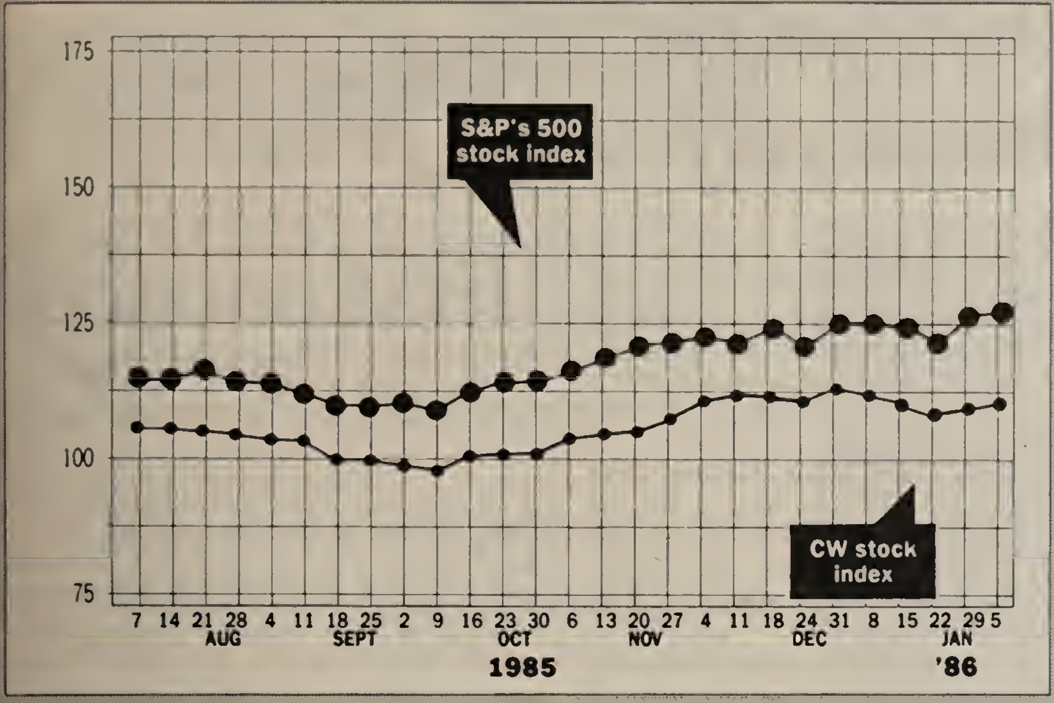
In a prepared statement, Mountain said, "We believe we have been included in this lawsuit because of the phenomenal success the Drivecard has achieved against a competing Quantum product."

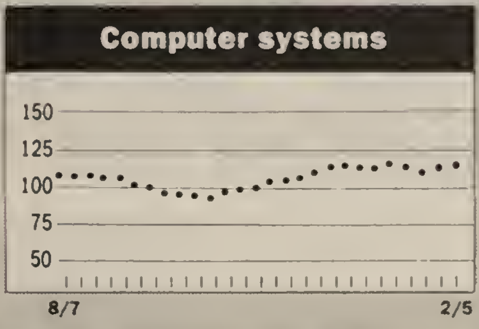
NEC has agreed to indemnify Mountain for any patent infringement.

NEC will defend the case and believes that the Quantum patent is invalid and not infringed by the disk drives sold to Mountain.

MITCHELL J. HAYES

Computerworld stock trading index

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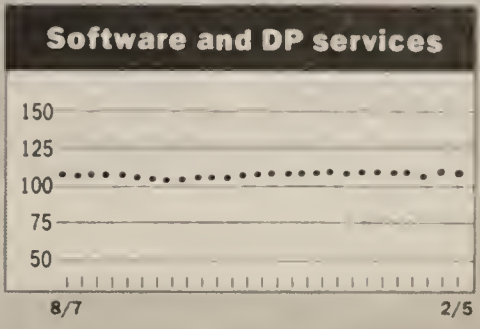
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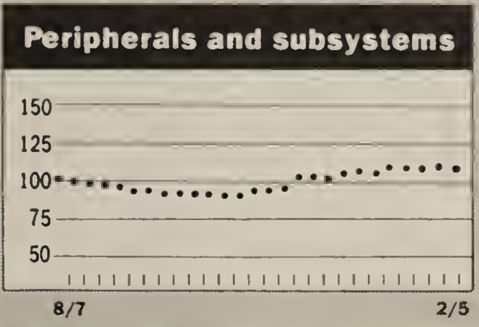
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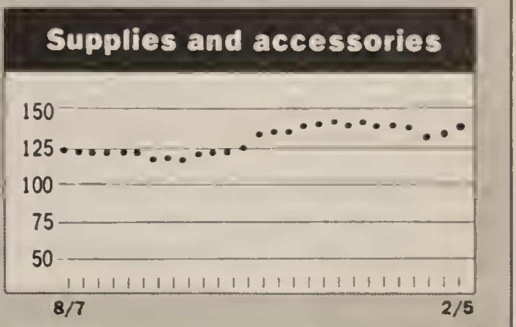
Supplies and accessories

All indexes reflect a historical base of 100 on Dec. 31, 1984, and trace stock market performance in relation to that base. The CW stock index represents the unweighted average performance of the six categories of computer industry stocks.

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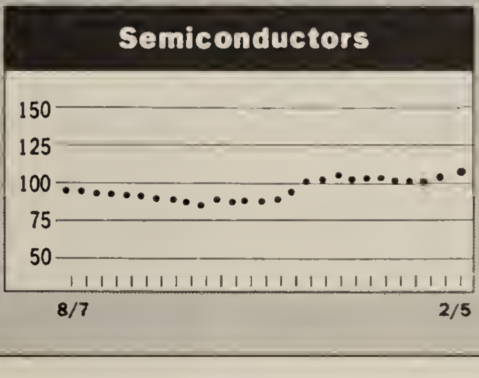
Computer systems	113.0	**114.3**
Software and DP services	104.0	**103.6**
Peripherals and subsystems	105.1	**104.5**
Supplies and accessories	129.7	**134.0**
Semiconductors	103.4	**104.7**
Leasing companies	102.7	**102.9**
CW stock index	109.9	**110.9**
Standard and Poor's 500 stock index	125.7	**127.3**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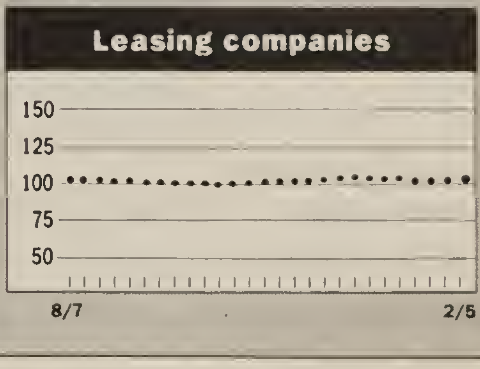

Leasing companies

Computerworld stock trading summary

CLOSING PRICES WEDNESDAY, FEBRUARY 5, 1986

COMPUTER SYSTEMS

EXCH		52-WEEK RANGE (1)	PRICE CLOSE FEB 15 1986	WEEK NET CHNGE	WEEK PCT CHNGE
O	ALPHA MICROSYSTEMS	5- 9	5 3/4	-1/2	-8.0
O	ALTOS COMPUTER SYST	9- 14	13 3/8	+1/2	+3.8
A	AMDAHL CORP	10- 18	15 5/8	-1/8	-0.7
O	APOLLO COMPUTER	9- 31	14 1/2	+1 3/4	+13.7
O	APPLE COMPUTER INC	14- 31	23 3/4	+1/8	+0.5
N	AT&T	19- 28	21 7/8	-1/2	-2.2
N	8URROUGHS CORP	52- 70	70	+1 1/4	+1.8
O	COMPAQ COMPUTER CP	5- 14	12 7/8	-1	-7.2
O	COMPUTER AUTOMATION	1- 9	2 3/4	+1/4	+10.0
A	COMPUTER CONSOLES	5- 14	6 3/4	-3/8	-5.2
N	CONTROL DATA CORP	15- 39	20	-1/4	-1.2
O	CONVERGENT TECHNOL	5- 13	12	-1 1/8	-8.5
O	CPT CORP	5- 8	5 3/4	0	0.0
N	CRAY RESEARCH INC	25- 71	64 7/8	-1	-1.5
O	DAISY SYSTEMS CORP	17- 38	16 5/8	-1 7/8	-10.1
N	DATA GENERAL CORP	31- 76	43	+1	+2.3
N	DATAPOINT CORP	5- 22	5 1/8	0	0.0
N	DIGITAL EQUIPMENT	85- 154	154 3/8	+1 3/8	+0.8
A	EECO INC	13- 16	14 1/2	0	0.0
N	ELECTRONIC ASSOC.	3- 6	4 1/4	+1/8	+3.0
N	FLOATING POINT SYST	18- 37	35 1/8	-3/8	-1.0
N	FOXBORO	22- 31	24 1/4	+1/4	+1.0
N	GOULD INC	20- 38	28 3/4	+2 3/8	+9.0
N	HARRIS CORP	22- 35	28 3/4	+1 7/8	+6.9
N	HEWLETT-PACKARD CO	29- 41	40 1/2	+1	+2.5
N	HONEYWELL INC	54- 87	78 1/2	+3 3/4	+5.0
N	I8M	117- 156	154 7/8	+3 7/8	+2.5
O	IPL SYSTEMS INC	1- 4	1 3/8	+1/8	+10.0
N	ITT CORP	28- 40	40 1/8	+1 5/8	+4.2
N	M/A-COM INC	13- 24	13 3/4	+7/8	+6.7
N	MANAGEMENT ASSIST	2- 28	2	0	0.0
N	MATSUSHITA ELEC(ADR)	49- 71	71	+2 1/8	+3.0
O	MENTOR GRAPHICS	13- 30	18 3/4	+1 5/8	+9.4
N	MODULAR COMPUTER SYS	6- 8	6 1/2	-3/8	-5.4
N	MOHAWK DATA SCI	1- 13	2 1/8	+1/8	+6.2
N	N8I INC	11- 20	11	+1/8	+1.1
N	NCR	25- 45	44 1/2	+7/8	+2.0
N	PERKIN-ELMER	22- 34	33 1/8	-3/8	-1.1
N	PRIME COMPUTER INC	15- 25	24 7/8	+1/8	+0.5
N	SPERRY CORP	39- 59	50 1/8	+1 5/8	+3.3
O	STRATUS COMPUTER INC	9- 25	21 3/4	-3/4	-3.3
O	TANDEM COMPUTERS INC	13- 29	22 5/8	-1/2	-2.1
N	TANDY CORP	24- 42	39	-5/8	-1.5
O	TELEVIDEO SYSTEMS	2- 4	3	0	0.0
O	TELXON CORP	10- 24	23 3/4	+3/4	+3.2
N	TEXAS INSTRUMENTS	86- 132	114 3/4	+6 3/4	+6.2
A	ULTIMATE CORP	8- 27	27 1/4	+1	+3.8
O	VECTOR GRAPHICS INC	0- 1	1/8	0	0.0
A	WANG LA8S "B"	15- 29	18 1/2	-1	-5.1
A	WANG LABS "C"	15- 29	18 5/8	-7/8	-4.4
N	XEROX CORP	37- 64	64	+2 5/8	+4.2

SUPPLIES & ACCESSORIES

EXCH		52-WEEK RANGE (1)	PRICE CLOSE FEB 15 1986	WEEK NET CHNGE	WEEK PCT CHNGE
N	AMERICAN 8US PRODS	21- 35	32	+2 3/8	+8.0
N	8ARRY WRIGHT	17- 29	18 5/8	-1/8	-0.6
A	DUPLEX PRODUCTS INC	13- 22	19 5/8	-1/4	-1.2
N	ENNIS 8US. FORMS	14- 24	22 1/2	+5/8	+2.8
N	3M COMPANY	74- 93	93	+4 1/4	+4.7
N	MOORE CORP LTD	15- 22	20 3/8	+1	+5.1
O	STANDARD REGISTER	22- 39	34 3/4	+1 1/4	+3.7
N	WALLACE COMP SERVICE	30- 41	41	+1 3/4	+4.4

EXCH: N = NEW YORK; A = AMERICAN; P = PACIFIC; 8 = 8OSTON;
L = NATIONAL; M = MIDWEST; O = OVER-THE-COUNTER

O-T-C PRICES ARE 8ID PRICES AS OF 3 P.M. OR LAST 8ID
(1) TO NEAREST DOLLAR

SOFTWARE & DP SERVICES

EXCH		52-WEEK RANGE (1)	PRICE CLOSE FE8 15 1986	WEEK NET CHNGE	WEEK PCT CHNGE
O	ADVANCED COMP TECH	2- 4	4 1/8	+3/8	+10.0
N	ADVANCED SYSTEMS INC	9- 18	16 7/8	-3/8	-2.1
N	AGS COMPUTERS INC	10- 24	22 7/8	+1/4	+1.1
O	AMERICAN SOFTWARE	9- 15	8 1/2	-5 1/4	-38.1
N	ANACOMP INC	2- 4	3 3/8	0	0.0
O	ANALYSTS INTL CORP	5- 11	5 1/2	-1	-15.3
O	ASHTON TATE	6- 21	20 5/8	0	0.0
O	ASK COMPUTER SYSTEMS	7- 25	12	+3/8	+3.2
8	ASTRADYNE COMP IND	1- 3	2	0	0.0
N	AUTOMATIC DATA PROC	35- 62	61 7/8	+3/8	+0.6
O	COMPUTER NETWORK	5- 9	5	+1/8	+2.5
O	COMPUTER ASSOC INT'L	18- 35	34	-1/2	-1.4
O	COMPUTER HORIZONS	5- 11	10 1/4	-3/8	-3.5
N	COMPUTER SCIENCES	13- 34	33 3/4	+1	+3.0
O	COMPUTER TASK GROUP	10- 24	23 1/4	+3/4	+3.3
O	COMPUTER USAGE	1- 3	1 5/8	0	0.0
O	COMPUTONE SYSTEMS	4- 11	4 1/8	-1/8	-2.9
O	COMSERV CORP	1- 6	3 1/2	0	0.0
O	COMSHARE	7- 12	10 5/8	-3/8	-3.4
N	CULLINET SOFTWARE	13- 33	14	-1	-6.6
O	CYCARE SYSTEMS INC	19- 27	19 3/4	-1/4	-1.2
O	HOGAN SYSTEM INC	4- 12	7 3/4	-1/2	-6.0
N	GENERAL ELECTRIC CO	56- 74	73	+3 1/8	+4.4
N	GENL MOTORS E (EDS)	20- 47	40 3/4	+1/2	+1.2
N	GTE CORP	38- 49	49	+3/8	+0.7
O	INFORMATION SCIENCE	1- 5	2 1/4	0	0.0
O	INFOTRON SYSTEMS CP	13- 24	16	+3/4	+4.9
O	KEANE ASSOCIATES	10- 20	11 3/4	-2	-14.5
N	LOGICON	25- 43	36 1/2	-1/8	-0.3
O	LOTUS DEVELOPMENT CP	15- 34	21 1/2	-2 1/2	-10.4
O	MCI COMMUNICATIONS	7- 13	12 3/8	-3/8	-2.9
O	MNGT SCI AMER INC	7- 16	11 5/8	-7/8	-7.0
O	MATHEMATICAL APP GRP	1- 8	1 3/4	0	0.0
O	MICOM SYSTEMS INC	12- 35	21	-1 1/4	-5.6
O	MICROPRO INT'L CP	2- 4	2 1/8	-1/8	-5.5
O	NATIONAL DATA CORP	8- 18	17 3/4	-1/8	-0.6
O	ON-LINE SOFTWARE INT	4- 11	10	0	0.0
N	PANSOPHIC SYSTEMS	14- 29	28 1/2	-3/4	-2.5
N	PLANNING RESEARCH	11- 19	15 3/4	+1 1/4	+8.6
O	POLICY MGMT SYSTS CP	17- 35	17 1/2	-1/2	-2.7
O	PROGRAMMING & SYS	4- 9	7 7/8	0	0.0
O	REYNOLDS & REYNOLD	31- 57	55 1/2	+ 3/4	+1.3
O	SEI CORP	13- 26	24	0	0.0
O	SHARED MEDICAL SYST	26- 37	36 5/8	+1 3/4	+5.0
O	SCIENTIFIC COMPUTERS	5- 8	5 1/8	-1/8	-2.3
O	SOFTWARE AG	12- 22	18	-1 1/8	-5.8
N	URS CORP	10- 14	12 1/8	+1/8	+1.0
N	UCCEL	11- 17	15 5/8	+1/4	+1.6
O	VM SOFTWARE	17- 24	21	-3/4	-3.4

SEMICONDUCTORS

EXCH		52-WEEK RANGE (1)	PRICE CLOSE FE8 15 1986	WEEK NET CHNGE	WEEK PCT CHNGE
N	ADVANCED MICRO DEV	22- 36	28 7/8	+5/8	+2.2
O	ADV'D SEMICONDUCTOR	7- 23	9 1/4	+1/4	+2.7
N	ANALOG DEVICES INC	18- 28	26 3/8	+3/8	+1.4
O	ANALOGIC CORP	11- 16	14 1/2	+1/4	+1.7
N	APPLIED MAGNETICS CP	9- 17	16 3/4	0	0.0
O	AVANTEK	18- 26	17 5/8	-1 5/8	-8.4
O	HADCO CORP	3- 7	5 1/4	-1/2	-8.6
O	INTEL CORP	21- 33	32	+3 1/4	+11.3
O	MICRO MASK INC	6- 12	6 1/2	0	0.0
N	MOTOROLA INC	29- 42	42 1/4	+2 1/4	+5.6
N	NAT'L SEMICONDUCTOR	10- 15	13 5/8	+7/8	+6.8
N	TERADYNE	17- 33	22 3/8	+1/8	+0.5

PERIPHERALS & SUBSYSTEMS

EXCH		52-WEEK RANGE (1)	PRICE CLOSE FEB 15 1986	WEEK NET CHNGE	WEEK PCT CHNGE
P	AM INTERNATIONAL	3- 6	5 7/8	0	0.0
A	ANDERSON JACOBSON	2- 5	2	-3/8	-15.7
O	AST RESEARCH INC	7- 33	24 1/2	-3 1/8	-11.3
O	AUTO-TROL TECHNOLOGY	3- 13	4 1/2	-1/4	-5.2
O	AVANT-GARDE COMPUTNG	3- 21	5 1/4	+1/4	+5.0
O	BANCTEC INC	6- 12	8 1/8	+1/4	+3.1
O	8EEHIVE INT'L	1- 2	1/8	0	0.0
N	BOLT,8ERANEK & NEW	20- 37	35 3/8	+1 1/2	+4.4
O	CAM8EX CORP	1- 3	1 1/4		+5.2
N	CENTRONICS DATA COMP	3- 11	4 3/4	+1/8	+2.7
A	CETEC CORP	6- 9	7 1/4	-1/8	-1.6
A	COGNITRONICS	4- 7	3 3/4	-1/2	-11.7
N	COMPUGRAPHIC CORP	23- 36	22 1/2	-3 1/8	-12.1
O	COMPUTER TRANSCEIVER	0- 1	3/8	0	0.0
N	COMPUTERVISION CORP	9- 44	12 3/8	+7/8	+7.6
N	CONRAC CORP	12- 17	17	+5/8	+3.8
A	DATAPRODUCTS CORP	11- 20	15 1/8	+1 1/8	+8.0
A	DATARAM CORP	4- 9	9 1/8	0	0.0
O	DATA SWITCH CORP	4- 9	5 1/2	-3/4	-12.0
O	DATUM INC	5- 9	5 3/8	+1/8	+2.3
O	DECISION DATA COMPUT	10- 20	11 7/8	-1/4	-2.0
O	ENDATA, INC	2- 8	4 7/8	+5/8	+14.7
O	EVANS & SUTHERLAND	12- 21	21 1/8	+1/8	+0.5
O	GANDALF TECHNOLOGIES	5- 13	6 5/8	+5/8	+10.4
N	GEN'L DATA COMM IND	8- 21	10 1/2	-3/4	-6.6
N	HAZELTINE CORP	20- 30	20 3/4	-2 7/8	-12.1
O	ICOT CORP	3- 10	9 1/2	-1/4	-2.5
O	INFORMATION INTL INC	10- 17	13 1/2	0	0.0
O	INTECOM INC	4- 11	4 1/8	-5/8	-13.1
A	LUNDY ELECTRONICS	10- 15	13 7/8	+1/4	+1.8
O	MEGADATA CORP	3- 8	3 3/4	-1/4	-6.2
A	MSI DATA CORP	7- 13	10 1/4	-3/8	-3.5
N	NASHUA CORP	24- 35	35	+3 3/8	+10.6
O	NETWORK SYSTEMS CORP	14- 27	14 5/8	-1 3/8	-8.5
N	NO AMERICAN PHILIPS	32- 45	38 5/8	-3/8	-0.9
N	NORTHERN TELECOM LTD	26- 41	25 5/8	-1/4	-0.9
O	OMEX	1- 3	1/2	0	0.0
N	PARADYNE CORP	6- 18	6 1/8	-1/2	-7.5
A	PENRIL CORP	7- 14	8	-1/8	-1.5
N	PLESSEY CO (ADR)	19- 28	23 7/8	+2 1/8	+9.7
O	PRINTRONIX INC	9- 18	11 7/8	-3/4	-5.9
O	QMS INC	6- 16	11 1/4	+1/8	+1.1
O	RAMTEK CORP	2- 7	3	-3/8	-11.1
N	RECOGNITION EQUIP	9- 17	15 1/4	0	0.0
N	SANDERS ASSOCIATES	30- 44	36	+2 3/8	+7.0
O	SCAN-TRON CORP	9- 17	17 1/4	+1/4	+1.4
N	SCIENTIFIC ATLANTA	10- 15	11 3/4	0	0.0
O	SEAGATE TECHNOLOGY	5- 9	8 3/8	-3/8	-4.2
N	STORAGE TECHNOLOGY	1- 4	3 3/4	+5/8	+20.0
O	SYKES DATATRONICS	0- 2	1/8	0	0.0
A	T 8AR INC	5- 9	5 1/2	-3/8	-6.3
A	TA8 PRODUCTS CO	14- 21	18 5/8	+5/8	+3.4
O	TANDON CORP	3- 9	4	-1/8	-3.0
A	TEC INC	6- 13	5 3/4	-5/8	-9.8
N	TEKTRONIX INC	47- 68	59	+3 1/4	+5.8
N	TELEX	34- 64	62 1/2	-1 1/4	-1.9
O	TESDATA SYSTEMS CP	0- 3	1	-1/8	-11.1
N	TIMEPLEX INC	15- 23	14 7/8	-1 1/8	-7.0
N	TITAN CORP	4- 11	11 3/8	+1/2	+4.5
O	VISUAL TECHNOLOGY	1- 3	3/4	+1/8	+18.1

LEASING COMPANIES

EXCH		52-WEEK RANGE (1)	PRICE CLOSE FEB 15 1986	WEEK NET CHNGE	WEEK PCT CHNGE
N	COMDISCO INC	10- 29	23 3/4	+1/8	+0.5
N	CONTINENTAL INFO SYS	5- 16	15 1/2	+1/4	+1.6
O	FINALCO GROUP INC	4- 5	4 1/2	+1/4	+5.8
O	PHOENIX AMERICAN INC	2- 4	3 7/8	+1/8	+3.3
O	SELECTERM INC	7- 12	6 1/2	0	0.0
N	U.S LEASING	32- 43	38 3/4	+1 1/8	+2 9

Source: Trade Quotes, Inc

COMPUTER INDUSTRY

INSIDE

Compaq's 1985 sales crack the half-billion-dollar mark/**137**

After a losing year, Gould consolidates several divisions/**138**

A storm brews over tax credits for software research and development/**147**

The end may be near for Osborne Computer/**168**

INSTANT ANALYSIS

"People say that I have come out of retirement, but I never retired. The only difference is that I was out of sales and marketing, and now I spend 40% of my time on that."

— An Wang, chairman, president and chief executive officer, Wang Laboratories, Inc.

Microsoft stock goes public: sale marks firm's maturity

By Eric Bender

BELLEVUE, Wash. — In a move analysts described as demonstrating its maturity and financial strength, Microsoft Corp., the second largest independent supplier of microcomputer software, filed for an initial public stock offering last week.

Separately, Microsoft was sued by Seattle Computer Products last week, the original creator of the operating system that evolved into Microsoft's mainstay MS-DOS product. The suit, filed in King County Court in Seattle, asks for $20 million in damages ($60 million if damages are trebled), along with a judicial declaration giving Seattle Computer an assignable, royalty-free right to license MS-DOS to purchasers of hardware. Microsoft replied that it believed Seattle Computer's claims to be erroneous.

The stock offering, expected to be made next month, will be underwritten by Alex Brown & Sons and Goldman Sachs & Co. It will cover 2.5 million shares of common stock, with a predicted price between $16 and $19 per share. About 24.7 million shares would be outstanding after the offering, giving the company a market valuation of between $395 million and $470 million.

"It's a milestone in our history that we've looked forward to for a lot of years," Microsoft Chairman William Gates commented informally after the filing. "It's time. We're at maturity as a company; we're 11 years old."

The preliminary prospectus disclosed that Microsoft achieved net income of $31.2 million, or $1.33 per share, on revenue of $162.6 million during calendar year 1985.

That would give the company an initial price/earnings ratio between 12 and 14.3. Among public micro software firms, Lotus Development Corp. stock currently maintains about a 9.3 price/earnings ratio, while Ashton-Tate is between 12 and 14,

See **MICROSOFT** page 168

Federal pacts spur integrators

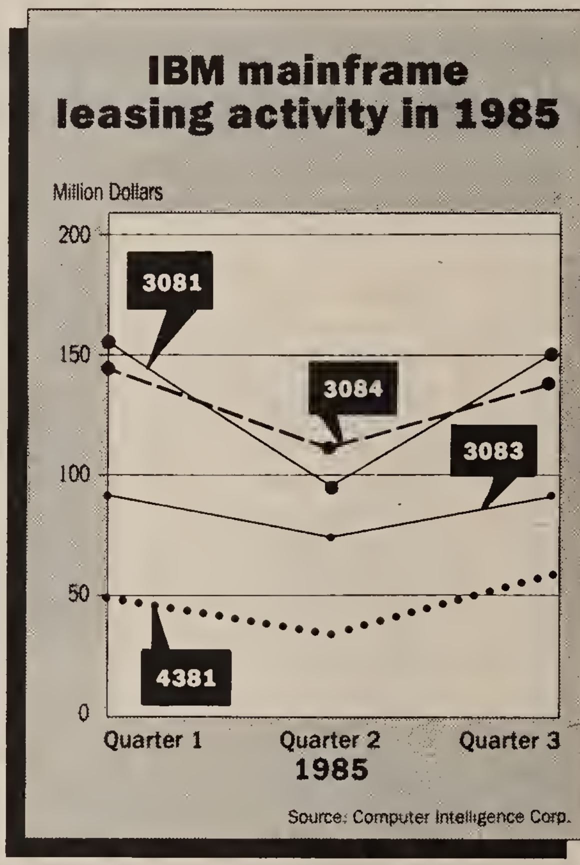
By Mitch Betts

WASHINGTON, D.C. — U.S. government agencies are turning to systems integrators more and more to handle multifaceted information management contracts, according to industry executives and analysts. In addition to its lucrativeness for the systems integrators, the trend is changing the way IBM, Sperry Corp. and other vendors do business with the government.

The shift toward systems integrators has been caused by the government's desire to merge computer systems design, networks, software development, facilities management and training into one contract, according to a report by International Data Corp. (IDC) in Framingham, Mass.

See **FEDERAL** page 142

IBM mainframe leasing activity in 1985



Source: Computer Intelligence Corp.

MITCHELL J. HAYES

INDUSTRY INSIGHT
Clinton Wilder
CW Senior Editor

IBM pounces with RT PC

Shakeout. The word strikes fear in the hearts of any computer entrepreneurs worth their salt, evoking the image of dozens of innovative startups falling into Chapter 11 proceedings while the big boys are left to gobble up the market share that is left behind.

Isn't it truly remarkable how this phenomenon seems to strike industry segments that have witnessed the entry of IBM?

That statement is not an accusation that Big Blue is to blame for such a trend. It has been argued by many IBM bashers, but one could justifiably invoke a classic cause-and-effect debate on the subject. Does IBM's entry create the shakeout, or does IBM simply enter markets that are headed for that result anyway?

To use a specific example, would GTE Sprint Communications Co. owner GTE Corp. and United Telecommunications, Inc. — whose billboards still say that U.S. Telecom, Inc. will save you more than Sprint — still have consolidated their long-distance telephone businesses into U.S. Sprint Communications Co. if IBM hadn't paired up with the No. 2 company in their industry, MCI Communications Corp.? There are valid arguments on both sides.

But whether the shakeout is actually caused by IBM's entry or not, the bottom line remains the same. And the next market to feel the effects is likely to be the red-hot area of workstations for engineering and design, where IBM's RT Personal Computer came in with a major splash two weeks ago.

The telltale signs are everywhere. Apollo Computer, Inc. is a textbook case of a company that probably grew too fast. It will emerge from its current

See **IBM** page 144

Two European firms hunger for slice of the U.S. market pie

Case subsidiary moves to network systems

By Clinton Wilder

SILVER SPRING, Md. — 1985 was a transition year for many companies in the turbulent data communications industry, but Case Communications, Inc. went through more changes than most.

Case Communications, the U.S. partner of Great Britain's Case Communications Ltd., grew out of the $32.4 million acquisition of Rixon, Inc. — Case's U.S. modem OEM — by British parent Case Group Plc. in May 1984. The Rixon name was dropped last April to signify Case's transition in the U.S. from a modem company to a vendor of complete data communications systems and networks.

"Rixon was a commodity company selling modems to the divested Bell operating companies and to distributors," said Jack Reis, senior vice-president of marketing for Case Communications in the U.S. "Since early last year, we have been converting it to a systems marketing company. We hoped we could have achieved profitability a bit quicker, but we fully expect to capitalize on the effects of that transition in 1986."

Case Group recorded a pretax loss of approximately $4.8 million, converted from British pounds, on sales of $70.4 million in the first six months of 1985, but it attributed the

See **CASE** page 137

Siemens making mark on the automation map

By Edward Warner
Computerworld News Service

PEABODY, Mass. — When General Motors Corp. introduced a method that enabled machines from various factory automation vendors to communicate, it lent a hand to the small players in the U.S. factory automation market, including Siemens-Allis Automation, Inc.

The U.S. subsidiary of West German electronics giant Siemens AG, Siemens-Allis hopes that GM's Manufacturing Automation Protocol (MAP) will convince potential customers that its equipment can interact with systems supplied by the heavyweights of U.S. factory automation, such as Allen-Bradley Co. and Digital Equipment Corp.

Siemens-Allis Automation sells programmable controllers that control factory floor processes and equipment. Although the company acknowledges having only 1% of the U.S. programmable controller market, it has a wealthy parent that is investing heavily in its U.S. offspring. Siemens AG, according to Siemens-Allis Automation President James Bardis, is No. 2 in worldwide programmable controller sales and has provided its U.S. automation subsidiary with the fourth or fifth largest sales force in its market.

Bardis said he believes that Sie-

See **SIEMENS** page 138

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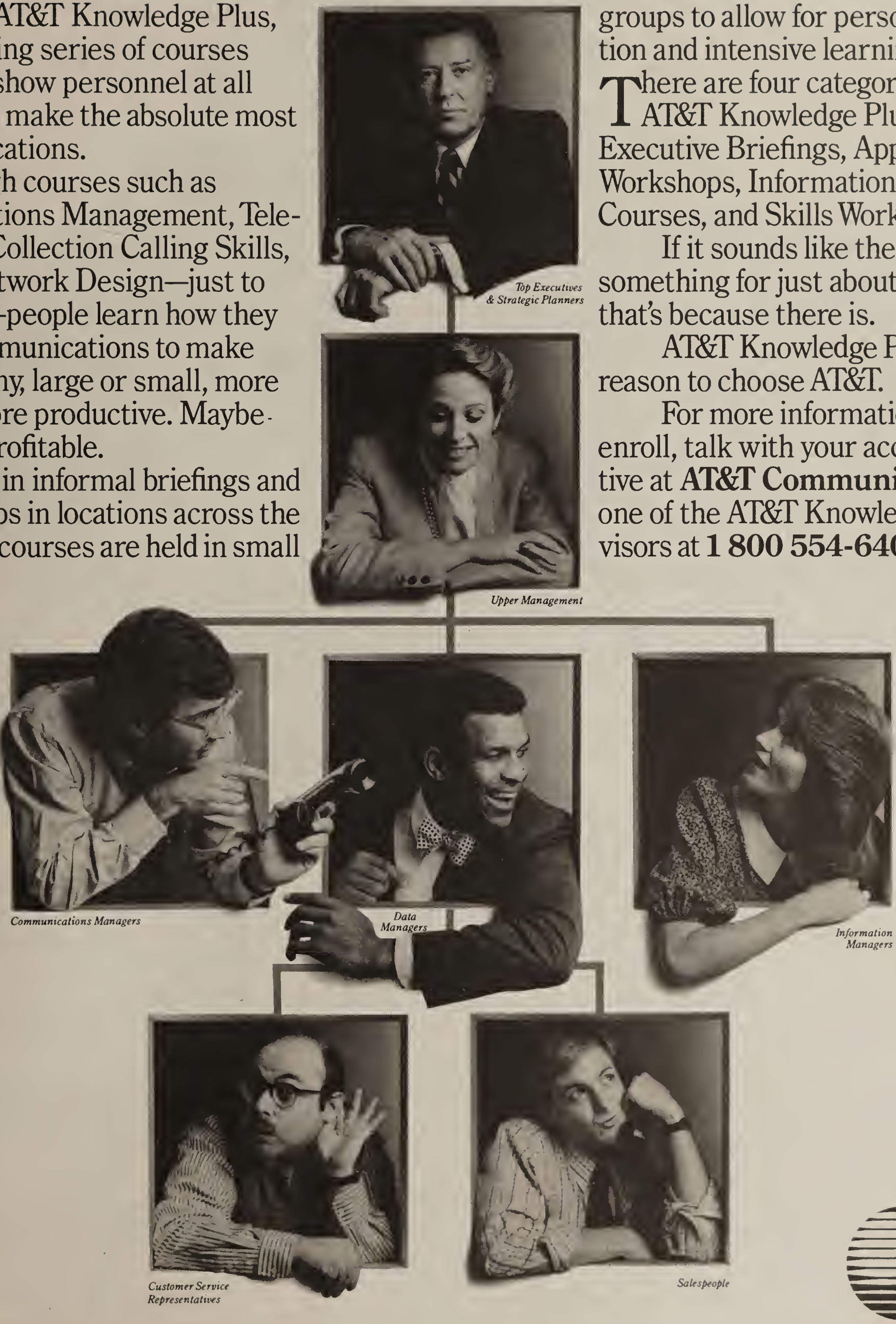

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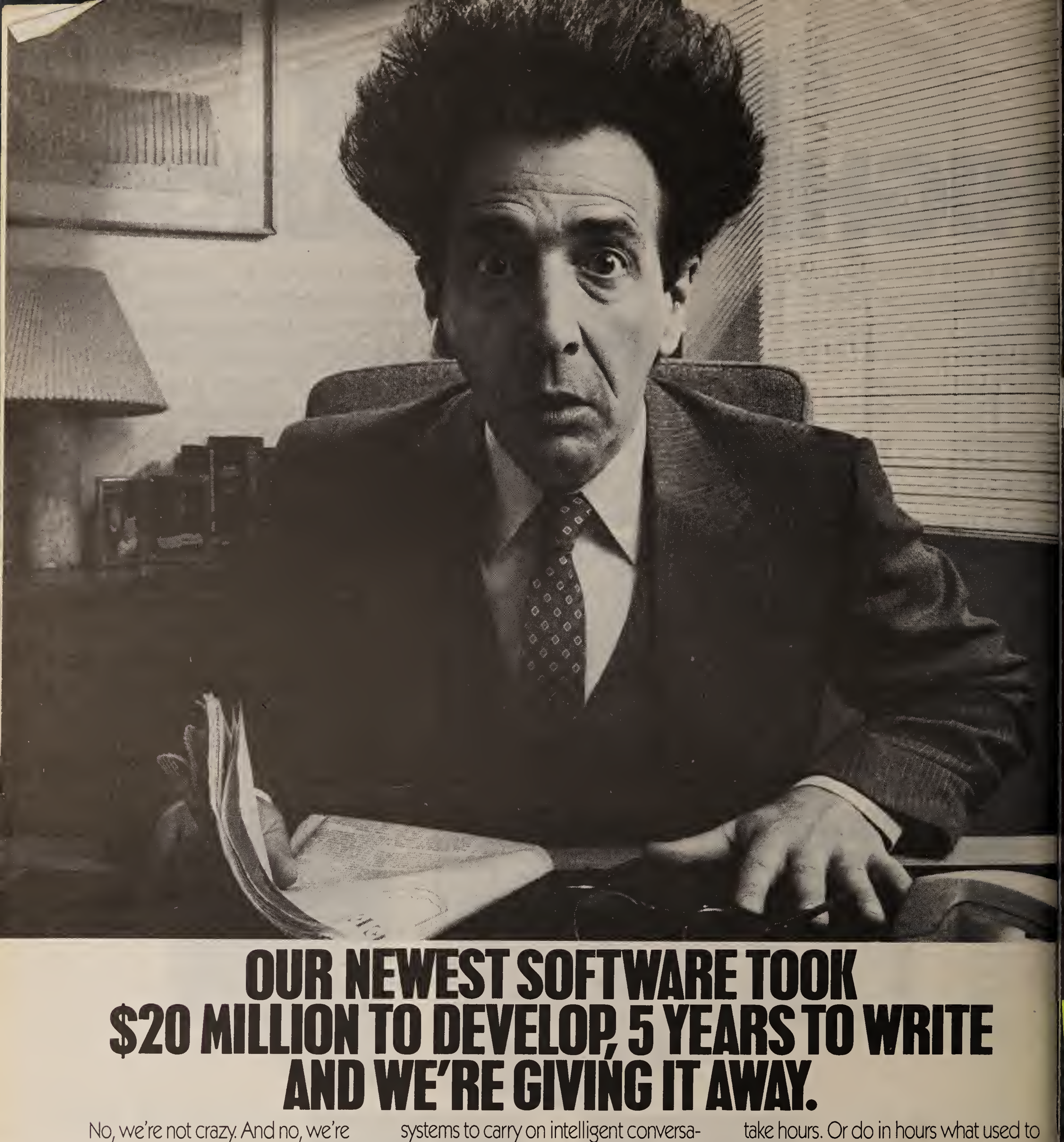

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